MANUFACTURER:

PRONAR Sp. z o.o.
17-210 NAREW, woj. Podlaskie, ul. Mickiewicza 101 A
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WHEELED FARM TRACTORS PRONAR of the type P8

ZEFIR 85
ZEFIR 85K

SERVICING INSTRUCTION

3rd Edition
Narew 07/2007

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ZEFIR 85
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TO BE FILLED IN BY THE SELLER:

Name and address of the selling point:.....
.....
.....
.....

User's name and address:.....
.....
.....

Type of the tractor:.....

Factory number of chassiss:.....

Factory number of engine:.....

Factory number of cab:.....

The nearest authorized point of service (APS):
.....
.....
.....
.....

Date of purchase:…….....

Date of expiration of guarantee validity:…….....

The servicing instruction constitutes the basic equipment of the farm tractor.

You must read this servicing instruction before setting about using the machine and you must observe safety rules.

In the event of loss or damage, you must acquire a new copy of servicing instruction by ordering it at the manufacturer.

In the event of selling or making available the machine to other user you must attach the servicing instruction.

On the first page of the instruction, the seller should write down the factory number of the machine according to the number placed on the data plate and also he should give his own data.

TABLE OF CONTENTS

A. INTRODUCTION

Farm tractors **ZEFIR**, thanks to their parameters and possessed connection and hitch devices can be aggregated with many suspended, semi-suspended and attached tools and agricultural machines. The aggregate of the tractor **ZEFIR** – machine (tool) will fully perform all works in your farm. Thanks to standing improvement and development of the design by the manufacturer, the tractors **ZEFIR** are reliable working tools. They can also perform earth, transportation and other works in dependance on the machine or tool with which they cooperate.

ATTENTION: Continual improvement of the tractor and alterations in the design connected with this may cause that the Servicing Instruction may not comply with realities of the tractor only to a small degree. In case of any doubts you must contact us by letter or phone.

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The user of the tractor ZEFIR – we thank you for your right choice !

B. SAFETY CONDITIONS

Observance of safety provisions and also provisions of road traffic ensures safety to the driver, other users and the tractor.

The text marked with the sign and embraced by the frame takes note of:
- possibility of occurrence of dangerous situation for the operator (performing the action) in case of non-comlying with the condition and recommendation;
- important information concerning proper exploitation of the tractor.

GENERAL REQUIREMENTS

- Familiarize yourself thoroughly with the servicing instruction before starting up the tractor because unsufficient knowledge of this servicing instruction may lead to occurence of situation being danger for the operator and aggregate.
- The tractor should be operated by the driver possessing appropriate driving licence and familiar with the rules of proper operation and exploitation of tractors and farm machines (tools).
- The tractors **ZEFIR** have the safe cab of the type **KS-11** not adapted for transportation of a passenger on public roads. **It is forbidden to transport a passenger on public roads.**

RULES OF SAFE OPERATION OF THE TRACTOR

- Carry out visual inspection of the tractor, its connection and hitch devices, the aggregated machine (tool) before starting work and **do not start work without having made sure of their completeness and proper connection**.
- Apply always reliable joints (original pins and their protection) to attached machines.
- Regulate the three points suspension system /TPSS/, so that the machines (tools) suspended on it in transportation position, will be rigidly connected with the tractor.
- Perform carefully all actions of servicing of the tractor and its equipping and especially braking and steering systems so that they will always be in a perfect technical state because it is decisive of your security.
- Perform all actions connected with cleaning and washing, preparing for work and technical servicing when the engine is not running and the tractor is braked with the parking (manual) brake.
- There is pressure in the cooling system during running of the engine (there is the pressure valve in the cork of the radiator).Therefore **do not unscrew the cork during running of the engine**, and when unscrewing do it very slowly and carefully in order to reduce pressure gradually in the system.
- Keep paricular care during removal of hot fluid from the cooling system, of oil from units of the driving system and steering system in order not to be exposed to scalding.
- Do not approach the tractor with open fire (even with lighted cigarette) during filling the tanks with fuel, servicing of fuel system and checking of batteries.
- Do not conduct any modifications and do not install parts or assemblies which introduce changes in the structure of the tractor without consultation with the manufacturer of the tractor.

RULES OF SAFE WORK WITH THE TRACTOR

- You must instal all shields before starting the engine or work with the tractor.
- Set the **gear-change** lever in the position **N** before starting the engine.The lever for drive switching-on / **PTO** (**power take off**)/ should be in the position **"PTO SWITCHED OFF"**.
- Do not start the engine and do not operate levers (pedals) of the steering when you are not taking the operator's place.
- Release the parking brake before bestiring and make certain whether the people helping with servicing or aggregating are not in dangerous situation especially whether they **are not between the tractor and the aggregated machine (tool).** Warn these people about the intention of moving by means of sound signal.
- Children must be kept away from the tractor and farm machines.
- Do not leave the tractor when it is on the move.
- Stop the engine and switch on the parking brake before leaving the cab.
- Do not work with the tractor in closed spaces without intensive and efficiently acting ventilation because exhaust gases may be a lethal danger.
- If the engine or the steering system turn out to be non-operational during driving, **interrupt driving**, because the tractor, in such situation, requires substantial forces applied to the steering wheel in order to steer it.

- **Do not work** and do not allow your helpers to work under the machines (tools) lifted on the lift of the tractor.
- Do not leave, in top position, machines (tools) suspended on the lift during longer stoppages of the tractor.
- Install weights of the front axle in case the wheels of front axle of the tractor lose contact with the ground after lifting the machine (tool) aggregated on the TPSS / three points suspension system /. If, despite this, the front wheels of the tractor do not obtain sufficient contact with the ground (allowing free manoeuvring with the aggregate), **do not work with** such machine or tool.
- Make certain before lifting or lowering the machine (tool) suspended on the TPSS and also during making of turns, if it does not come to collission with cooperating people or subjects threatening with occurrence of dangerous situation.
- **Do not work using** jointed and telescopic shafts **without shields** for drive of machines and tools from PTO of the tractor.
- **Switch off the PTO drive** during checking (during stoppage) of the aggregated machines (tools) driven from PTO /power take off shaft/ of the tractor.
- In case of utilization of supplementing and assisting assemblies (devices) make certaing if they can cooperate with the tractor, familiarize yourself with rules of their proper installing and cooperation with the tractor.

In case of use of front leader you must observe admissible loads onto the front axle and recommended (admissible) velocities. You must also use counterweight on the rear suspension system.
It is inadmissible to utilize the front leader without counterweight suspended on the rear TPSS / three points suspension system /.

REMEMBER! – it is your tractor.
If you use it incorrectly, it may be dangerous for you, strangers and environment. Don not work with fittings non-designated for cooperation with the tractor !

DRIVING THE TRACTOR

In order to avoid dangerous situations (especially threatening with overturning the tractor) keep care and prudence during driving the tractor. Adapt speed to conditions prevailing on the road, especially during moving on uneven (hilly) land,while crossing ditches,on slopes and bends (turning back points). Do not take sharp turns under full load and with high velocities of the transport.

SAFETY RULES DURING PERFORMANCE OF TRANSPORT WORKS

During moving on roads - also non-public roads you must absolutely observe road traffic provisions binding in the country on the area of which the tractor is moving.

- During moving on public roads the tractor should be equipped with **the warning reflective triangle** and on the tractor there should be installed **the triangular board distinguishing slow-moving vehicle.** In case the tractor is moving in aggregate with a trailer or machine, the triangular distinguishing board should be installed on the trailer or machine (according to the provisions).
- Do not drive the tractor (with a trailer, machine or tool) without operational braking installation as well as lighting and signalling installation in vehicles of the unit or with non-connected installation of the trailer (machine) with the tractor. **It threatens with an accident.**
- Do not leave the trailer (machine, tool) disconnected from the tractor on the public road. In case of failure turn aside onto the shoulder, set up the warning reflective triangle (equipment of the tractor and trailers) in the way consistent with the provisions and switch on the standing (parking) lights.
- Do not leave the tractor (aggregate) on slopes. In case of necessity lower the tool, switch on the first gear , switch on the drive of the front axle (position „switched on") and the parking brake.
- Do not exceed the speed of the tractor aggregate over 30 km/h, do not drive down the slope when the engine is switched off, "in neutral" or when the clutch pedal is pressed. **It threatens with danger**.
- Do not transport people on trailers and machines (tools). **It is forbidden !**
- Take care so that the pedals of independent brakes **will be** connected and their action will be simultaneous.
- Do not drive the unit of the tractor and trailer when **it is lighting the red lamp** signalling unsufficient pressure in the braking system of the trailer (trailers). This can prevent effective braking.
- In case of aggregating the machine on the rear TPSS we cause obturation of the rear combined lights.Additional combined lights must be applied on the machine.

- Attach trailers and machines (tools) to the tractor only in the manner provided by the manufacturer of the tractor that is with original pins with protective elements (cotters). Other way of connecting may cause danger.
- Do not work with trailers with **total weight greater than 3000 kg** which do not possess brakes.
- Observe absolutely road traffic provisions during towing the tractor. It is admissible to tow the tractor with non-running engine and with operational steering system, with speed not exceeding 10 km/h.

WORK OF THE TRACTOR WITH THE SWITCHED ON POWER TAKE OFF SHAFT (PTO)

- During work with machines (tools) driven by the PTO shaft, in case of necessity of inspection of the machine (its disconnecting), before leaving the cab make sure if the PTO shaft is not rotating.
- During work with machines (tools) driven by the PTO shaft persons staying in the vicinity of rotating units or elements of the machine shoud not be dressed with loose-fitting clothes because it may be the cause of occurrence of hazard.
- During work with stationary machines driven by the PTO shaft, always switch on the parking brake, block the rear wheels in front and in the rear and set up front wheels as for driving straight on.
- Do not perform actions connected with washing, regulation or servicing of machines (tools) driven from the PTO shaft **when the engine is running.**
- Always apply roof shield and when the PTO shaft is not used, place the protective cap onto the ending of the PTO shaft.
- Do not use shafts for driving of machines without complete structurally designed shields.
- Always use properly selected (in dependence on the magnitude of torque of the driven machine which must be transmitted)jointed and telescopis shafts. Value of moment in w Nm is usually given on the shield of the PTO shaft.

RULES OF FIRE SAFETY

- Do not add, on no account, gasoline or mixtures to diesel fuel oil because it may considerably increase hazard of ignition or explosion.
- Always turn off tightly the plug of fuel filler to the tank.
- Do not fill fuel when the engine is running.
- Do not smoke cigarettes during filling fuel neither during servicing of fuel system.
- Do not fill the whole volume of the tank with fuel. Always leave small space for expansion of fuel.
- Always refill fuel after finished work in order to reduce formation of steam condensate in the tank.
- Do not store engine fuels and lubricants in distance smaller than 3 m from the place of permanent parking of the tractor. Equip this place with operational fire-fighting equipment.
- Keep care during repairs connected with welding.Clean the place of repair so that the focus of fire will not be formed during work.
- Take care of tightness of the exhaust system and so that the exhaust system will not be contaminated, especially from the outside, with inflammable substances.
- Do not allow formation of leaks from fuel and hydraulic installation.
- Equip the tractor with fire extinguisher GP-1X, BC-DB, or extinguisher of similar type and fasten it in the grip.

RULES OF SAFE WORK ON A SLOPE

During work on a slope or sloping fields quantity of fuel in the tank should occupy minimum of 1/4 of its capacity so that the possibility of formation of air pockets in the fuel systems will not take place.
If it is possible, avoid driving the tractor across the slope (- the desired direction – uphill and downhill the field). If the work is to take place across the field you must additionally:
- use the widest wheel track,
- conduct returns in the direction of the hill,
- lift the tool not higher than it is necessary to conduct the manoeuvre (e.g. return),
- check if the pressure in wheels is identical,
- reduce velocity to minimum during returns,
- during use of reversible plough start ploughing from the top of the hill; in this way the wheels from the side of the hill top will go in the furrow – reducing the angle of inclination of the tractor.

FACTORY GUARANTEE

The manufacturer, handing over the new tractor, grants guarantee that means the manufacturer assures that the product does not have manufacturing defects and material defects detection of which is possible during manufacturing process.

The guarantee consists in conducting, at the guarantor's cost, (specified in the guarantee book) of repair (including replacement of parts). The detailed guarantee provisions are included in the guarantee book attached to each tractor. The guarantee book is the only document enabling the purchaser of the tractor to benefit from guarantee servicing in authorized servicing points and it is not subject to replacement.

ATTENTION! The devices secured with leaden seals may be repaired only by the authorized personnel of repair points. Wilful rupture of leader seal causes loss entitlements resulting from the guarantee.

ATTENTION! Non-observance of recommendations included in the Servicing Instruction of the Tractor causes loss entitlements resulting from the guarantee.
The cost of repair of damages occurred as a result of exploitation inconsistent with the Servicing Instruction are covered by the purchaser of the tractor.

HANDOVER OF THE TRACTOR TO THE PURCHASER

The new tractor should be started for the first time by the guarantee mechanician or authorized employee from the commercial service.

The first starting embraces detailed visual inspection and checking of action of the tractor and instruction of the buyer on basic rules of utilization of the tractor. It is advisable that persons directly servicing and using the tractor should be present during the first starting. The owner or user should obtain vocational guidance embracing the following issues:

- guidelines concerning safe servicing of the tractor,
- location and meanings of numbers of the engine and the tractor,
- indicators and controllers,
- running-in,
- manner of starting and stopping,
- selection of gears in dependence on operational conditions warunków pracy,
- use and regulation of the brakes and clutch,
- use and regulation of the interlocking of the differential gear unit,
- application of PTO,
- functioning and steering of the hydraulic system,
- connecting and disconnecting of to ols on the rear and front TPSS (option),
- points of lubrication with oil and grease,
- replacement of oils,
- replacement and clearing of filters,
- functioning and venting of the fuel system,
- engine cooling system, pull of wedge belts,
- servicing of the electric installation,
- steering system and change of Wheel track,
- pressure in tyres,
- connecting, use and steering of external hydraulics,
- securing of nuts and bolts,
- transportation and storage of fuel.

SAFETY SIGNS

Safety signs presented on the subsequent pages have been placed on the tractor in places show on the following drawings. Their task is to ensure safety for you and accompanying persons. Please look through labels and instructions of procedure presented in this Instruction together with operators of the machine.

ATTENTION! Keep labels clean so that they will always be legible.

If the labels have been destroyed or become illegible you should obtain new ones from the authorized dealer.

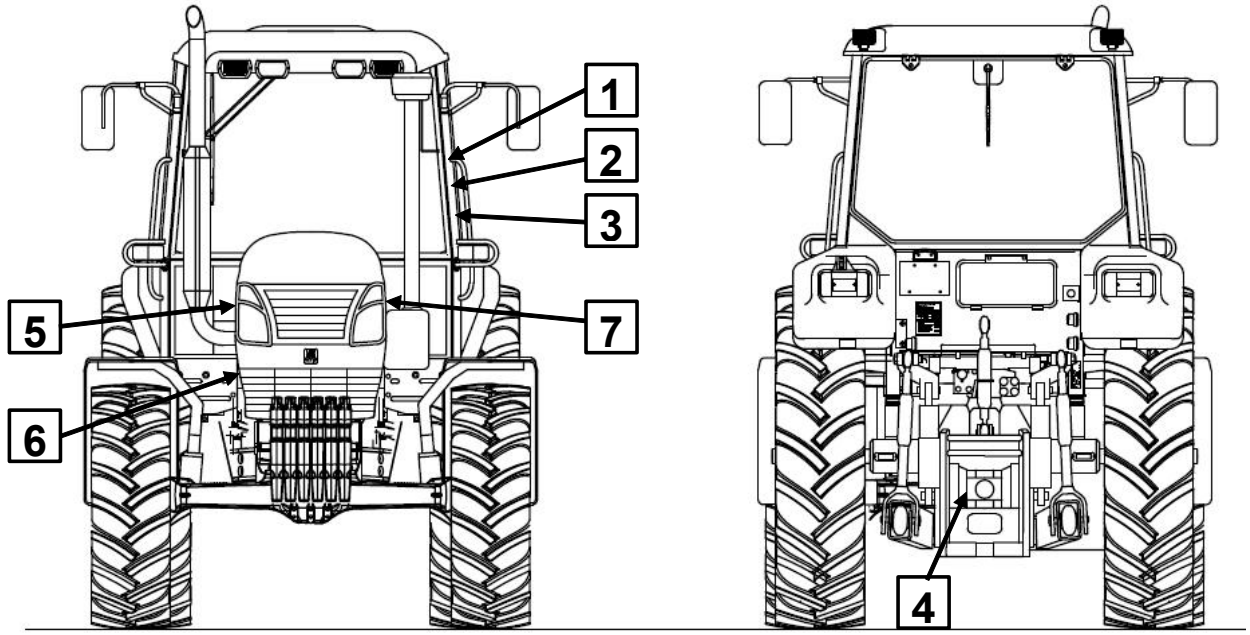
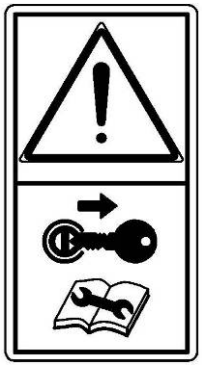


Fig. B-1 Position of safety signs on tractors **ZEFIR.**

Pos. 1. Position: on the left middle column inside the cab



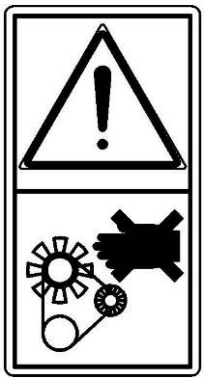
Switch off the engine and Take out the key from the ignitron switch before starting servicing action or repairs.

Pos. 2. Position: on the left middle column inside the cab

Pos. 3. Position: on the left middle column inside the cab

Pos. 4. Position: at the rear of the tractor, on the housing of PTO shaft

Pos. 5. Position: on the housing of the alternator



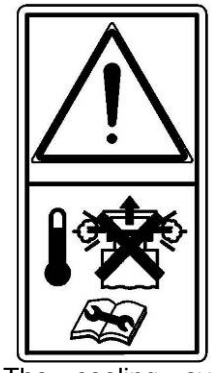
ATTENTION! Do not bring hands and clothing closer to rotating fan and driving belt in order to avoid serious injury.

ATTENTION! SWITCH OUT THE PTO AND STOP THE ENGINE BEFORE CONNECTING, REGULATION AND WORK WITH TOOLS DRIVEN BY THE PTO.

Pos. 6. Position: the housing of the starter

Do not short-circuit terminals of the starter in order to start the engine. Never start the engine standing on the ground. Start engine only with key from the driver's seat making sure that the levers of the gearbox and the PTO are in neutral position and that the parking brakes switched on.

Pos. 7. Position: the housing of the radiator



ATTENTION! The cooling system is under pressure. Wait until the cooling fluid is Cooley and carefully unscrew the plug of the radiator.

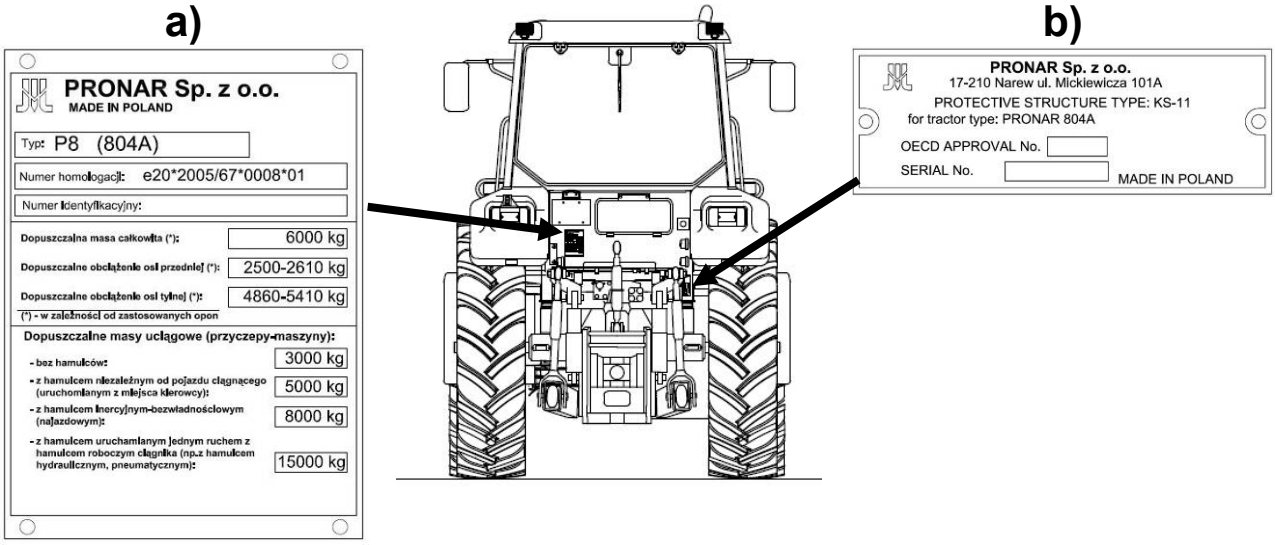


Fig. C-1 Position of the manufacturer's tables
a – data plata of the tractor; **b** – data plate of the cab;

The number of the tractor (chassis) is placed on the plate located on the rear wall of the cab on the left side of the tractor (see **fig. C-1 pos. a**).

Type and number of the cab is given on the plate located on the left wall of the cab on the right side (fig**. C-1 pos. b**)

Fig. C-2 Position of the tractor plate (on the left side of the tractor)

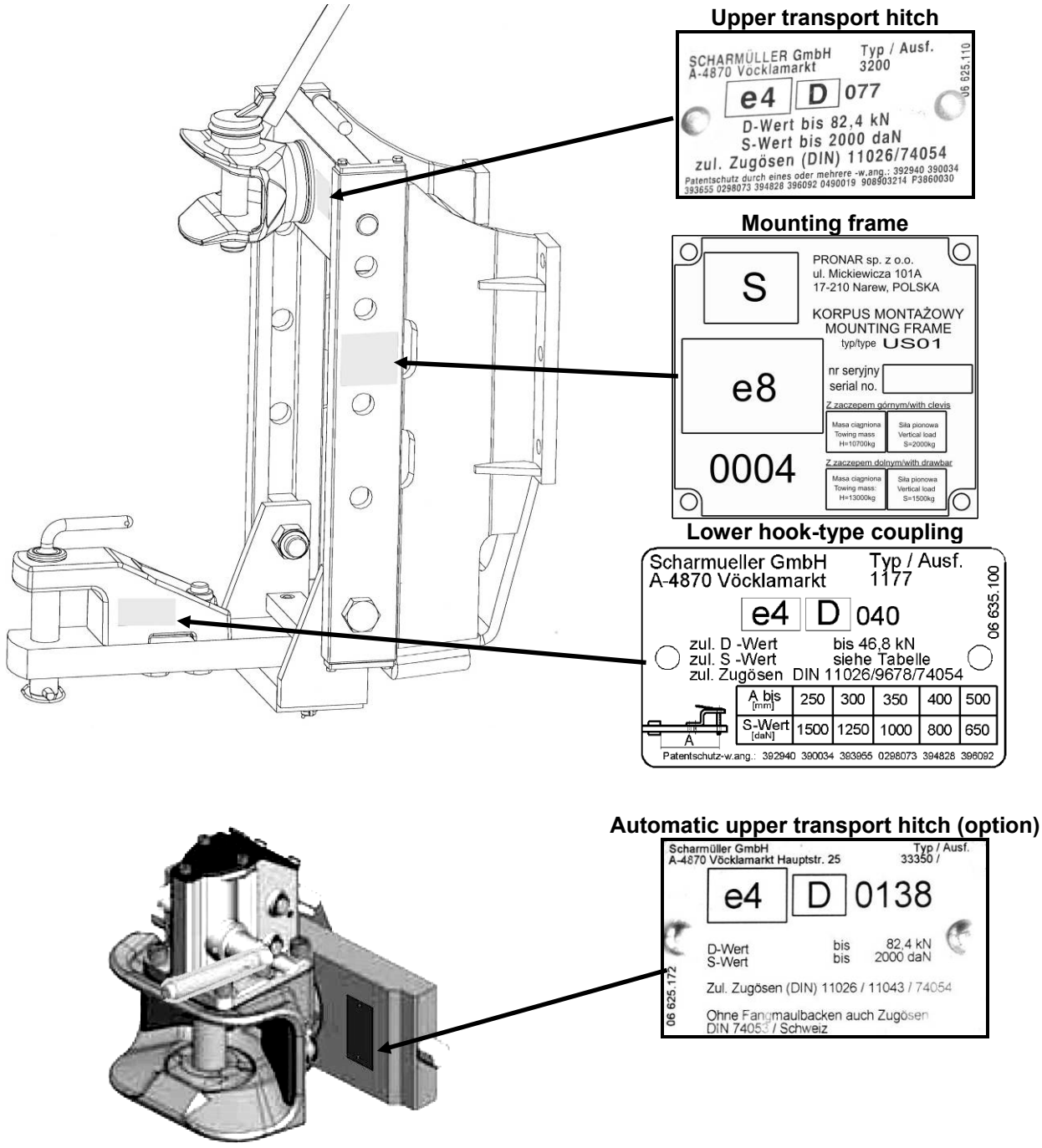


Fig. C-3 Position of plates of hitch devices

CAB

Before starting work with the tractor you must get acquianted with appropriation of control organs, indicators and their indications. Information contained in the Instruction will help you to drive the tractor correctly and safely to perform, by means of this tractor, planned works with possibly the least effort.

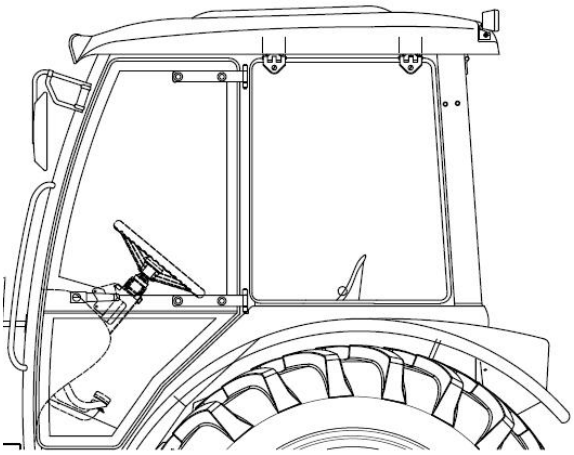


Fig. D-1a The cab of tractors **ZEFIR type P8**

The cab has been designer so as to ensure appropriate comfort and convenience to the operator. The standard equipping of the cab is composed of the heating and ventillation system of the cab, sun visor, windscreen wiper with washer, rear window wiper, half-open side and rear windows, half-open flap of the roof and externally regulated rear-view mirrors.

You can go into the cab from the left side and the right side. However it is recommended to enter from the left side with regard to levers of the driving system located on the right side of the seat. They may hinder entering from the right side of the cab.

In order to get into the cab you must stand in front of the doors and open it by means of external handle equipped with the lock closed by means of key. Next catching hold of the hand-rail situated outside the cab on the left side and the hand-rail on internal part of the door on the right side you must climb the anti-slip foot-plates and go into the cab. Close the door after entering and sit down on the operator's sit.

ATTENTION: In order to prevent falls when entering and going out from the tractor you must use hand-rails and foot-plates. Remove mud, snow, ice and pollutions.

Going out from the cab you must open the door, catch the hand-rails and being with own back turned outside of the cab, go down the foot-plates holding the hand-rails.

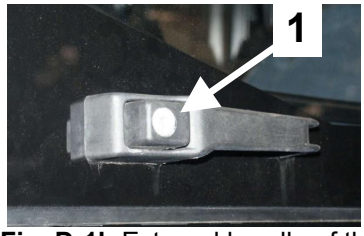


Fig. D-1b External handle of the door

The right and left of the cab are equipped with handles with lock which allow to close the cab from outside by means of key. I order to open the closed door you must turn the key and next push inwards the lock **1** being in the handle.

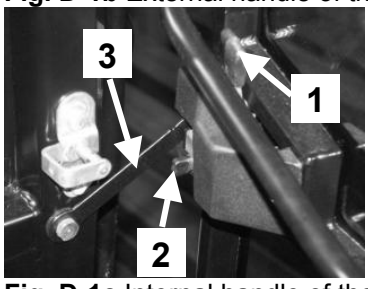
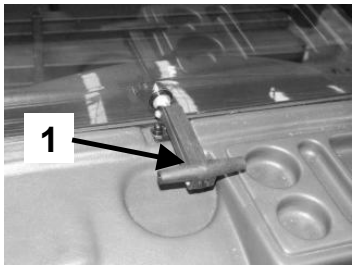


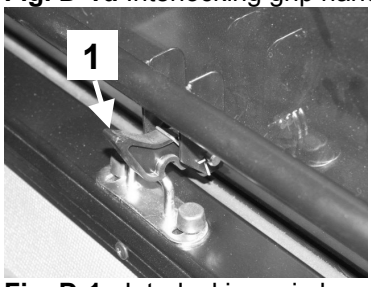
Fig. D-1c Internal handle of the door

In order to open the door from inside you must pull the lever **1** releasing the mechanism of the door lock. The lever **2** serves for interlocking of the door lock and protecting against accidental opening the door.
After opening we may leave the door in fully opened position kept thanks to gas spring or kept in slightly half-open position thanks to special lever located at the cab frame which must be deviated so that it will possible to snap the door lock on the cab frame.



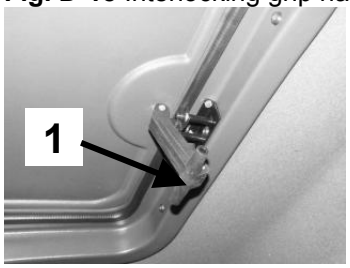
Side windows are mounted on hinges. The have possibility to interlock in losed or in partly opened position by means of the lever mechanism with grip handle **1**.

Fig. D-1d Interlocking grip handle of the side window



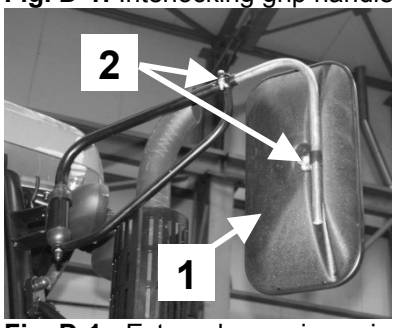
The rear window can be interlocked by means of the interlocking grip handle **1** in closed position or it can be fully opened and kept on gas spring.

Fig. D-1e Interlocking grip handle of the rear window



The flap of the roof can be interlocked in closed position or in partly open position by means of the lever mechanizm with grip handle.

Fig. D-1f Interlocking grip handle of the roof flap



The external rear-view mirrors **1** have the possibility to extend the arm and to regulate the angle of position. In order to regulate the mirror you must loose the bolts **2** fastening the mirror arm and tighten them after conducting regulation. The rear-view mirrors must be positioned so as to achieve the best visibility from the rear of the tractor.

Fig. D-1g External rear-view mirrors

ARRANGEMENT OF CONTROL ORGANS

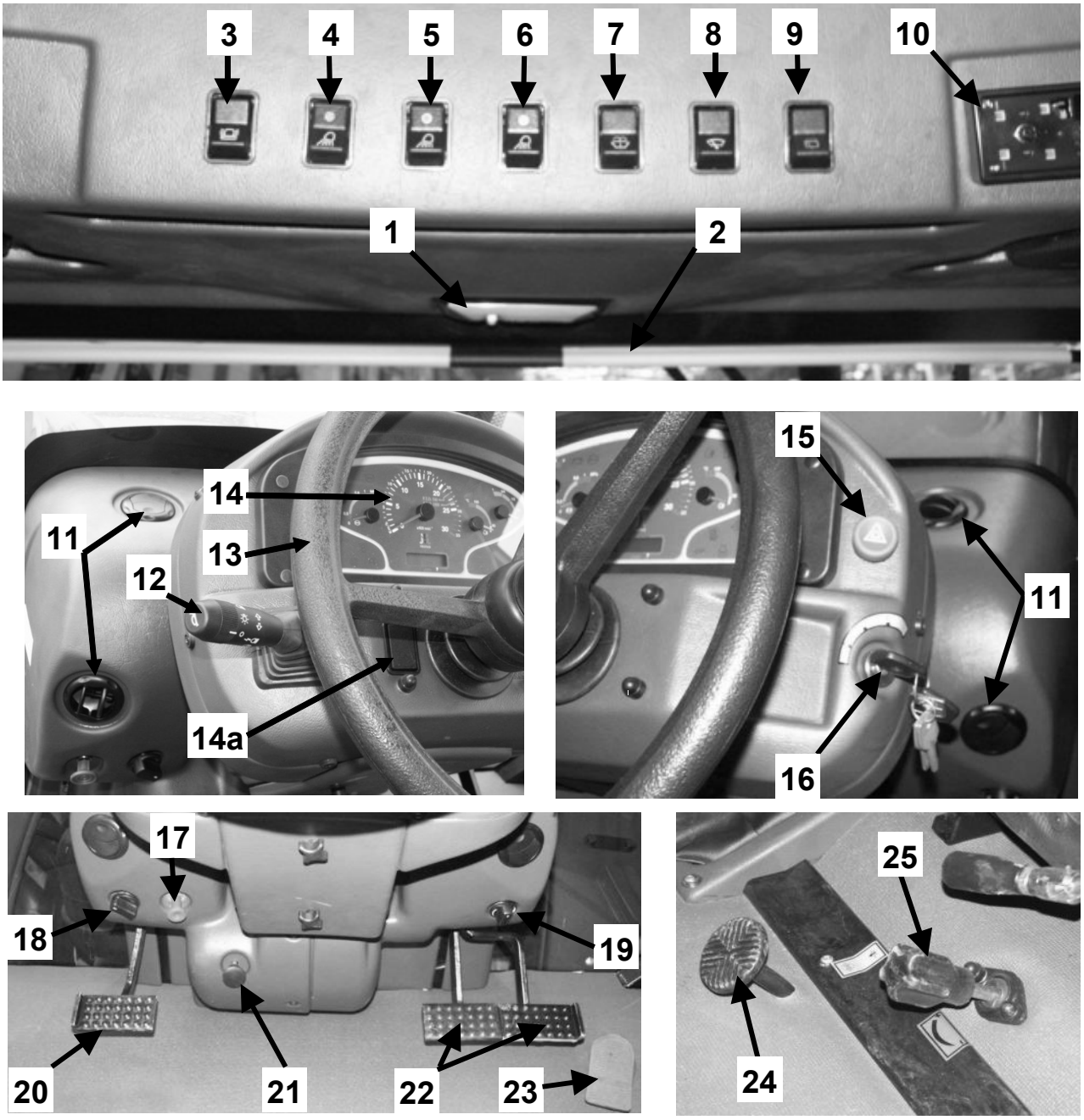


Fig. D-2a Location of control and checking organs of the tractors **ZEFIR**
1 – switch of cab lighting; **2** – sun roller blind; **3** – switch of warning light (ZEFIR 85K); **4** – switch of upper front working headlights (internal pair); **5** - switch of upper front working headlights (external pair) so called "field headlights"; **6** - switch of upper rear working headlights; **7** – switch of windscreen washer; **8**- switch of windscreen wiper; **9** – switch of rear window wiper; **10** – radio receiver; **11** – (controlled) screens of air outlets at the steering column; **12** – multifunction switch of lights and horn; **13** – steering wheel; **14** - panel of indicators; **14a** – plug (ZEFIR 85) or switch of traffic beams on brackets (ZEFIR 85K); **15** – switch of warning flasher lights; **16** – switch of starter (ignition switch); **17** – pull rod for stopping the engine "STOP"; **18** – handwheel for steering the temperature of hot air blow-in from outlets at the steering column; **19** - handwheel for steering the velocity of hot air blow-in from outlets at the steering column; **20** – clutch pedal; **21** – pull rod of intelocking of angular location of the steering wheel; **22** – brake pedals (of the left and right wheel connected with pawl); **23** – pedal for steering fuel dosis („with gas"); **24** – pedal for interlocking of diffrential gear of the rear axle assembly; **25** – handwheel for regulation of velocity of lift lowering speed;

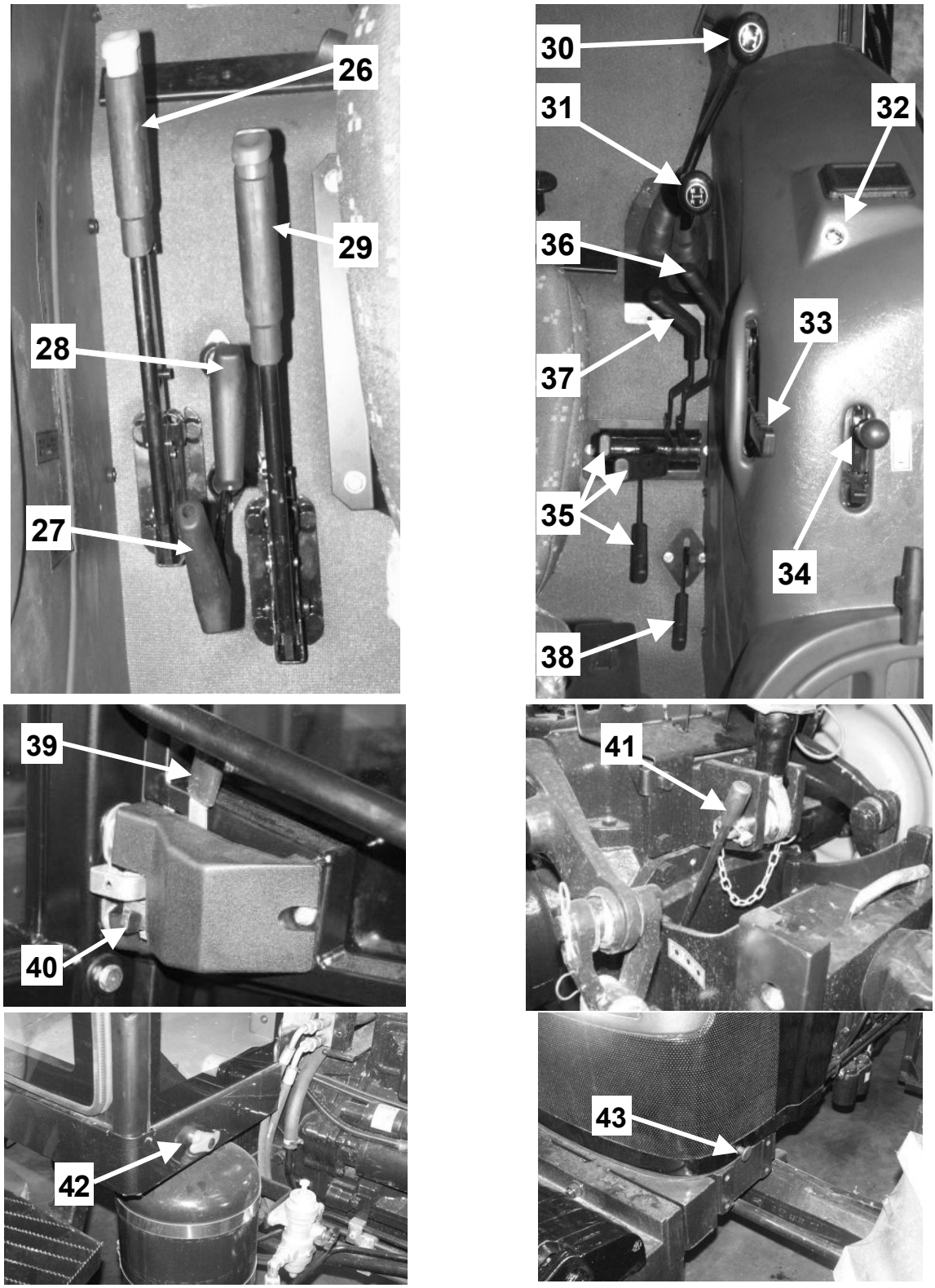


Fig. D-2b Location of control and checking organs of the tractors **ZEFIR**
26– lever of PTO clutch; **27**– lever for switching of PTO revolutions (dependent-switched out-independent); **28**– lever for switching on of drive of front axle; **29** – lever of parking brake (hand brake); **30** – gear change lever; **31** – lever for selection og group of gears; **32**- lighter socket (12 V); **33** – pedal for steering fuel dosis („ gas"); **34** – lever for quick lifting and lowering of a tool suspended on the TPSS; **35** – levers for controlling of pair of hydraulic quick couplings of the tractor; **36** – lever of position regulation of rear TPSS; **37** – lever for regulation of the rear TPSS by means of power lift; **38** – lever for regulation of lift function sensitivity (reaction speed); **39** – pull rod for opening of cab doors from inside; **40** – lever for interlocking of the cab door lock; **41**– lever for switching of PTO rotational speed range 540/1000 (outside the cab); **42** – battery switch; **43** – pull rod for opening of engine mask;

PANEL OF INDICATORS OF THE TRACTORS ZEFIR

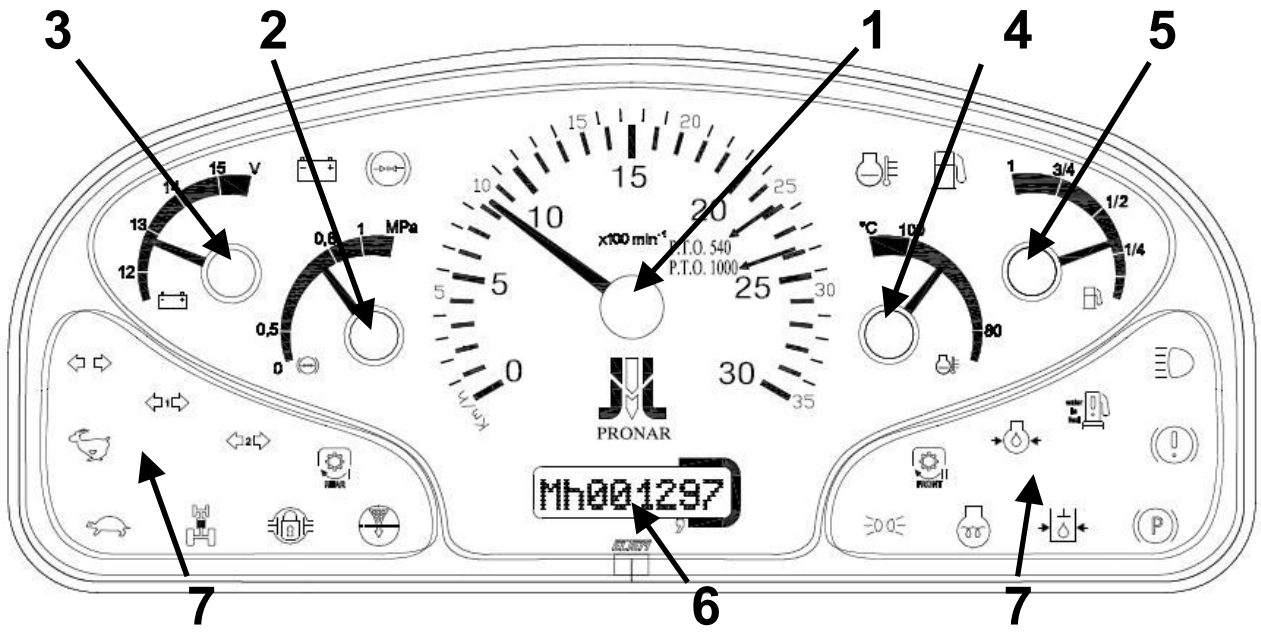
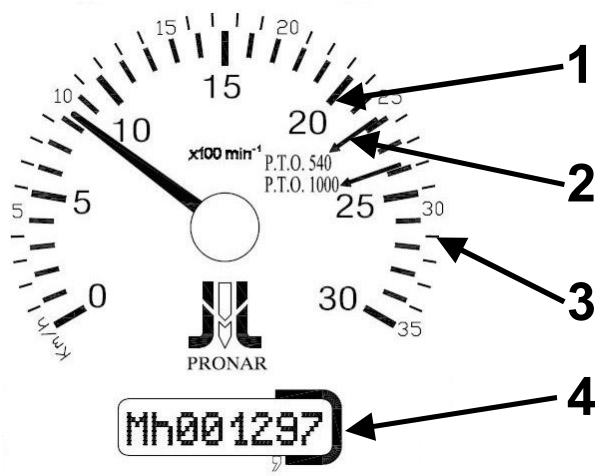


Fig. D-3 Control indicators of the tractors **ZEFIR**
1 –tachometer; **2** – air pressure indicator in pneumatic system; **3** – voltahe indicator in electric installation of the tractor; **4** – cooling fluid temperature indicator; **5** – fuel level indicator; **6** –indicator of motor hours; **7** – panel of control lamps;

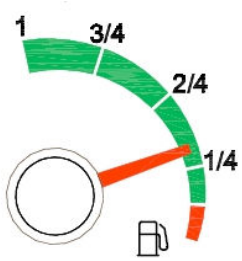


Indicator of motor hours, of driving speed and tachometer

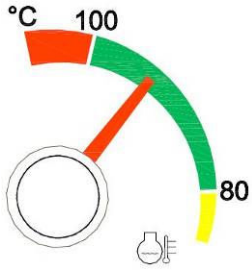
It indicates ratotional speed of engine,tractor driving speed and number of worked motor hours (see **fig. D-4**)

Fig. D-4 Tachometer scale.

1 – scale of rotational speed of engine shaft (white colour);
2 – range of engine shaft revolutions at which PTO achieves the velocity of 540 or 1000 rev./min (green colour)
3 – scale of the tractor driving speed (yellow colour)
4- counter of motor hours indicates and keeps in memory the number of motor hours. Ater switching on ignition the current state of engine working hours is displyead on display unit with accuracy up to 0,01 Mh /motor hours/. Function for measurement of number of worked Mh is implemented with the moment of starting the engine. The maximum range of indications amounts to 9999.99 Mh.



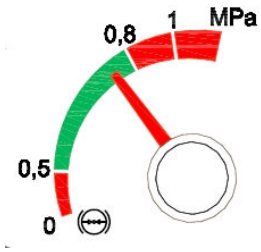
Fuel level indicator
If the indicator arrow indicates zero during work, there is 3÷5 dm^3 (l) of fuel in the tank.



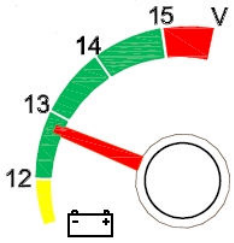
Cooling fluid temperature indicator
It indicates temperature of cooling fluid in °C. The normal temperature of fluid should range within the limits of green field. If the indicator arrow is in the red field, the engine is overheating and you must determine the cause of it. The cause may be:

- too little quantity of fluid in the cooling system;
- unsufficiently stretched wedge belt of the fan drive;
- external or internal contamination of the radiator.

Lack of elimination of the cause of engine overheating may lead to serious average.



Air pressure indicator
In the pneumatic system for braking trailers.This pressure should be within the range of 0.5÷0.8 MPa (5÷8 kG/cm^2) i.e. in the green sector of the scale.



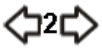
Voltage indicator in the electric installation of the tractor

Panel of control lamps

Meaning of symbols of control lamps on the panel is as follows:

 - control lamp for switching of direction indicator lamps of the tractor

 - control lamp for switching of direction indicator lamps of the first trailer

 - control lamp for switching of direction indicator lamps of the second trailer

 - control lamp for air pressure in the pneumatic installation steering brakes of trailers. It is on when pressure drops below the permissible pressure. It is also on when there is unsufficient pressure in the tank;

 - control lamp for level of brake fluid in the tank – it is on when the level drops below the permissible level. **You must check the braking system and refill the level of brake fluid.**

 - engine in version with wet air filter – unused
- engine in version with dry air filter - control lamp for contamination of air filter (engine) – it is on when the filter requires servicing (removal of contaminations). **You must check the air filter and if required clean or replace filter cartridges.**

 - unused

 - unused

 - unused

 - unused

 - unused

 - control lamp for charging a battery. If the lamp is when the engine is running it means fault and the falt must be eliminated. The lamp is also on when you set the switch key of the starter in position **I** (see **fig. D-6**);

 - control lampof cooling fluid temperature. It is alight when temperature exceeds the permissible level (the arrow of temperature indicator is on the red field)

 - control lamp for switching of parking lights

 - unused

 - unused

 - control lamp for switching of parking brake

 - control lamp of oil pressure in the engine. It is on when pressure drops below the permissible pressure. It is also on when you set the switch key of the starter in position **I** (see **fig. D-6**);
ATTENTION! The engine may not run when the control lamp of oil presssure is on. In such case you must stop the engine and eliminate the cause of lack of pressure.Lack of pressure in lubrication system may lead to serious failure of the engine.

 - control lamp of oil pressure in steering system. It is on when pressure drops below the permissible pressure during running of the engine. It is also on when you set the switch key of the starter in position **I** (see **fig. D-6**); Momentary blinking is permissible.
ATTENTION! The steering system is non-operational. Before starting work you must eliminate the cause of lack of pressure in the system.

 - control lamp for switching of start-up assist system in low temperatures (heater on suction manifold). The system is activated in temperatures below 0°C.

 - fuel level control lamp.

 - unused

MULTI-FUNCTION SWITCHES

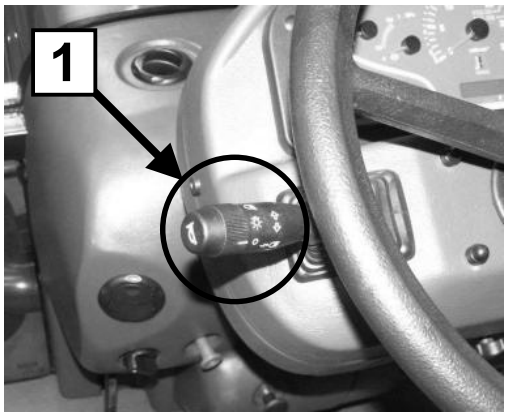


Fig. D-5 Switch at the steering column.
1 – multi-function switch of lights and horn (sound signal)

Multi-function switch of lights and horn (fig.D-5;pos.1) functions as follows:

- by turning the handwheel **(A)** to the position it is achieved switching-on of parking lights;
- by turning the handwheel **(A)** to the position it is achieved switching-on of traffic beam;
- by turning the handwheel **(B)** forward it is achieved switching-on of the right direction indicator;
- by shifting the handwheel **(B)** backward it is achieved switching-on of the left direction indicator;
- by pressing the handwheel **(B)** in place indicated by it is achieved horn (sound signal).

IGNITION SWITCH

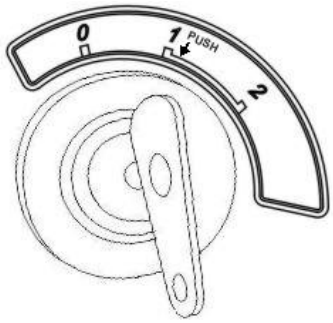


Fig. D-6 Controlling of engine start-up. **1** – starter switch;

On the control board (**fig. D-6**), on the right side, there is the starter switch „ignition switch" having three positions:
0 – switched out STOP (you may take out the key); **1** – switching-on of control devices; **2** – switching-on of the starter

We switch on the starter by turning the key (with simultaneous pressing it) from position **1** to position **2**. After starting the engine, the key returns automatically from the position **2** to the position **1**.

Sound signalling so called "buzzer" functions in position **1** of the ignition switch.

You need not leave the ignition switch in position 1 for a long time because it may cause damage of panel of indicators (overheating the excitation circuit resistor of the alternator).

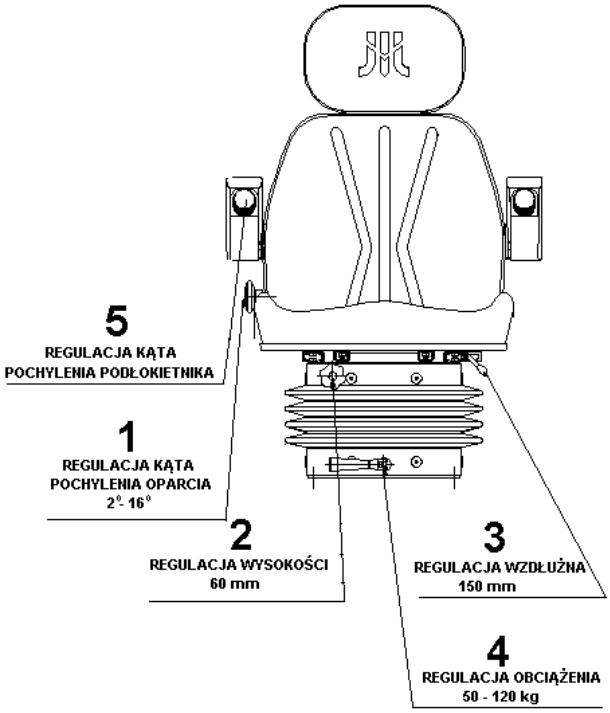
DRIVER'S SEAT

Four types of driver's seat which provide good working conditions, have possibility of regulation and matching of them to the weight of the driver, his dimensions and individual reguirements can be mounted in the tractors **ZEFIR.**

Before starting work with the tractor you should conduct regulation of position of the seat so that the position which you take will be most comfortable for you. All seat regulations are conducted when **sitting on** it**.**

ATTENTION! Elements of regulation of seats (bolts, nuts, rollers, guides) must be cleaned and greased every 1000 mth /motor-hours/ but no rarer than once a year.

a) the seat PRONAR of the type MT50/M60

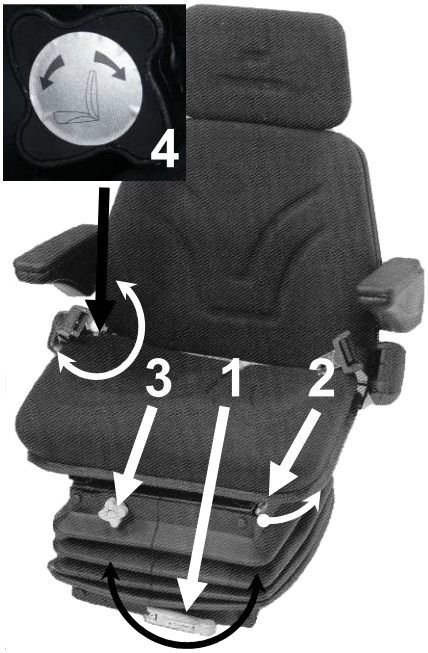


Regulation, in dependence on the weight of a driver-operator (50÷120kg) is conducted by means of the jointed handwheel **4** placed in the lower part of the amortizing system through change of tension of springs. Longitudinal shift (within the range of ±75 mm) is achieved after disengaging of rack with the lever **3** located under the seat cushion. After setting position you must release the lever of intelock what ensures to keep the set position. The angle of inclination of the back-rest (within the range of 2°÷16°) is fluently regulated by means of the handwheel **1**. Height of the seat is regulated fluently (within the range of ±30mm) through turning the handwheel **2**. Regulation of inclination angle of armrests is conducted by means of handwheels **5** placed in armrests.

1 REGULATING THE INCLINATION ANGLE OF THE BACK-REST 2°-16°
2 REGULATING THE HEIGHT 60mm
3 LONGITUDINAL REGULATION 150 mm
4 REGULATION OF LOAD 50 -120 kg
5 REGULATING THE INCLINATION ANGLE OF THE ARMREST

Fig. D-7 Locarion of regulating organs of the seat PRONAR of the type MT50/M60

b) The seat - SEAT of the type TOP S-698 (MOL 698)



The seat - **SEAT** has the possibility of regulation and matching to operator's weight and dimensions. Regulation of amortization rigidity is set with the handwheel **1** depending on the operator's weight withi the range of 50-120kg.

The lever **2** serves for shifting of the seat within horizontal plane. In order to conduct regulation you must pull aside the lever **2** and next intelock the reguired position by releasing the lever.

The handwheel **3** serves for regulating the seat height within the range of 60mm.

By means of thehandwheel **4** you can set the back-rest inclination angle fluently.

The seat has the possibility to regulate the height of headrest through its pulling-out.

Fig. D-8 Arrangement of regulating organs of the seat - SEAT

c) the seat GRAMMER of the type MSG85/721 and DS 85H/90A

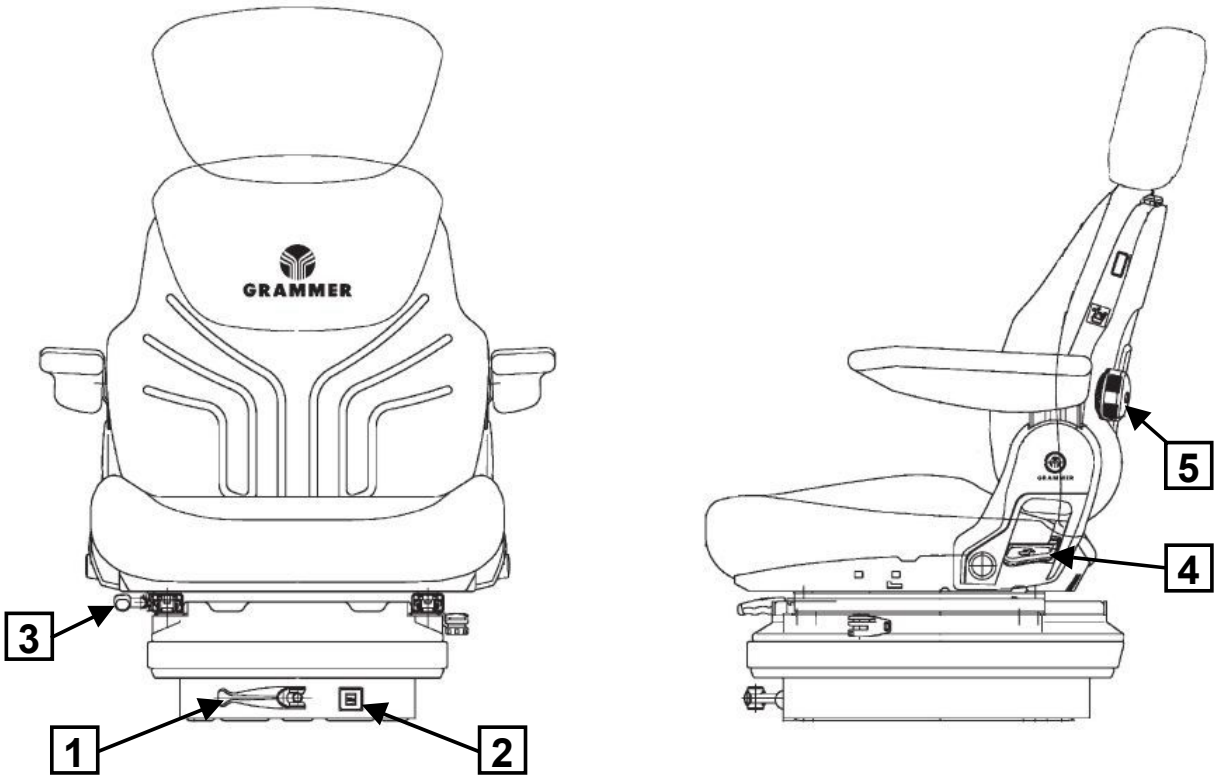


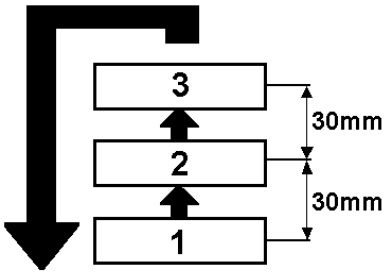
Fig. D-9 Arrangement of regulating organs of the seat GRAMMER.

Regulation of amortization rigidity is set with the handwheel **1** depending on operator's weight. Next to the handwheel there is the indicator **2** of the set driver's weight.

The lever **3** serves for shifting the seat within horizontal plane every 10 mm. Regulation is possible after lifting the lever **3,** releasing the lever causes intelocking of the fixed position**.**

The regulating lever **4** serves for setting the back-rest inclination angle every 2,5º. Regulation mus be conducted when sitting on the seat. After lifting the lever **4** you must set the required back-rest angle and interlock the fixed position by releasing the lever.

The handwheel **5** serves for regulation of position and degree of convexity of the back-rest. Regulation is conducted by turning the handwheel **5** to the right or to the left until the required position is achieved.



The seat **GRAMMER** has three positions of height; low-1; middle-2; high-3 (see the fig. next to)

Regulation is conducted from the operator's sitting position every 30mm. Change of height consists in lifting the seat by hand until the moment of clutching of latch in the required position.Lifting of the seat over the position 3, causes return to position 1.

The seat has the possibility of regulating the headrest height through its pulling-out.

Fig. D-10 Marking of places of fastening of safety belt.

ATTENTION! In the tractor cab there have been placed pictograms (Fig. D-10) showing places for fastening of safety belt.

VENTILLATION AND HEATING OF THE CAB

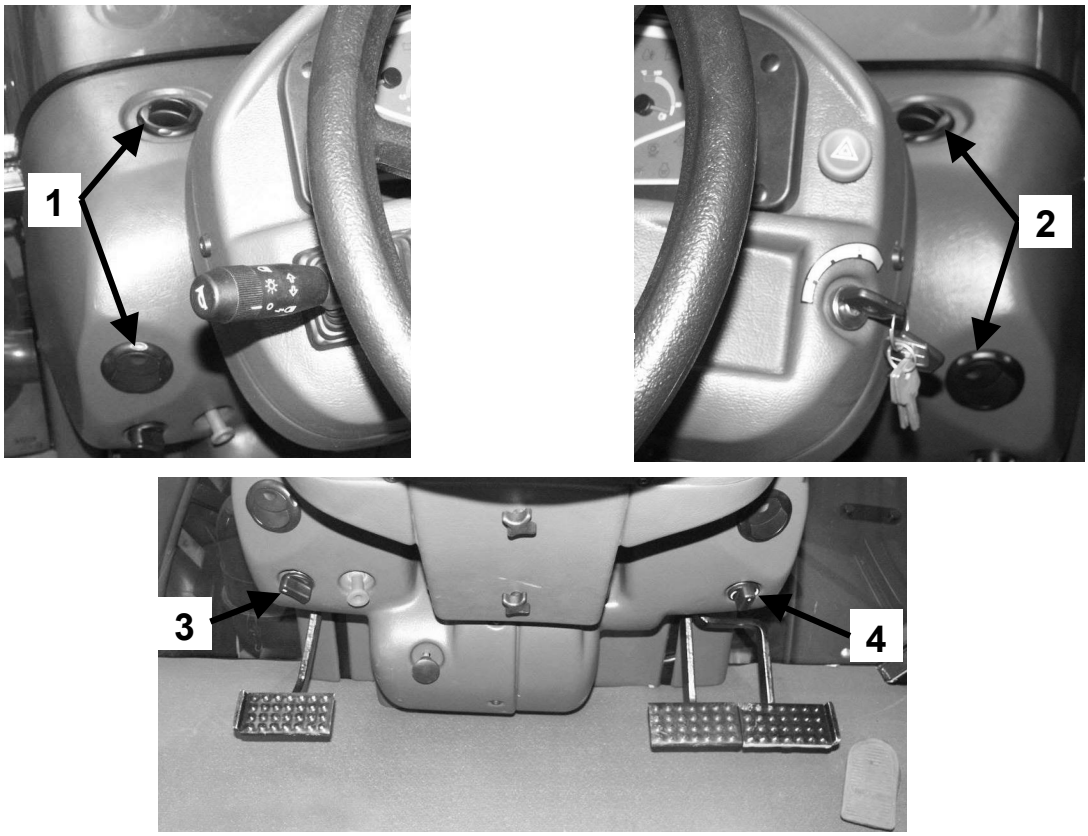


Fig. D-11 Ventillation and heating system.
1 – (controlled) screens of air outlets from the left side of the steering column; **2** – (controlled) screens of air outlets from the right side of the steering column; **3** – handwheel for steering temperature of hot air blow-in from outlets at the steering column**, 4** – handwheel for steering velocity of air blow-in at the steering column.

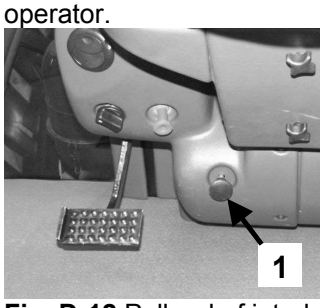
The systems allows heating the cab in low temperatures and ventillation of the cab in high temperatures by means of screens at the steering column.

ATTENTION ! : It is not recommended to use water in the cooling and heating system of the cab. Tou must use antifreeze fluid. In the factory the cooling system and the heater in the tractors ZEFIR have been filled with the fluid „BORYGO ECO".

If the system of engine cooling and the cab heating is filled with water , you must remove water from the engine cylinder block and radiator and from the cab heater.

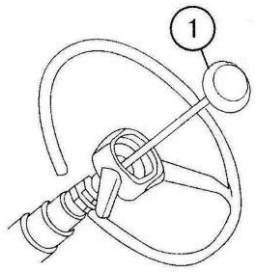
STEERING SYSTEM

The tractors **ZEFIR** equipped with hydrostatic steering systems with metering pump characterized by possibility of steering the tractor when the engine is not running. The system possesses the hydraulic pump (which is not switched off) driven from the tractor engine. A driver has the possibility to change of angular inclination and change of position along the axis of steering column for its comfortable location by the operator.



The pull rod **1** (**fig. D-12**) serves for changing angular position, pull it and hold it. In order to change the position of steering wheel for the required position, release the pull rod and cause interlocking by means of small motions. The mechanism of change of angular position has 4 positions (within the range of stroke) in which the steering-wheel is blocked. You can select one from 5 positions co 5° within the range from 25° to 40°.

Fig. D-12 Pull rod of interlocking for inclination of steering wheel (column).



Change of position of steering wheel along the axis requires (**fig. D-13**):

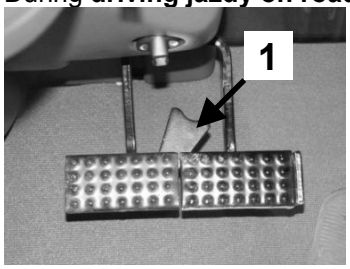
- unscrewing the cover of steering wheel axis together with screw **1**;
- setting up the steering wheel in the selected (optional) within the regulation range of 100 mm;
- zakręcenia pokrywki wraz ze śrubą **1** (ręcznie).

Fig. D-13 Changing position of steering wheel along its axis. **1** – cover of steering wheel axis together with screw

BRAKES

Working brake (basic brake)

During **driving jazdy on roads** brake pedals should be **interlocked** with the pawl **1** (**fig. D-14**)



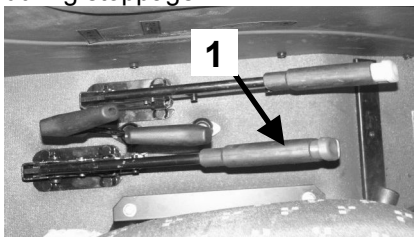
In field works,when there is necessity of making turns of small radius (returns) you may brake, after unlocking the pawl, the left or right wheel, pressing one of pedals respectively.
You must brake fluently, without jerks, pressing the pedal to the end and without stopping in indirect positions. Do not keep leg on pedals without need because it leads to accelerated wear of friction lining of brake disks.

Fig. D-14 The pawl intelocking pedals of working brake (unlocked position)

When driving on roads the pawl must interlock pedals of working brake (foot-brake).

Parking brake (emergency brake)

The parking brake was installed at left side of the seat. It serves for immobilization of the tractor during stoppage.

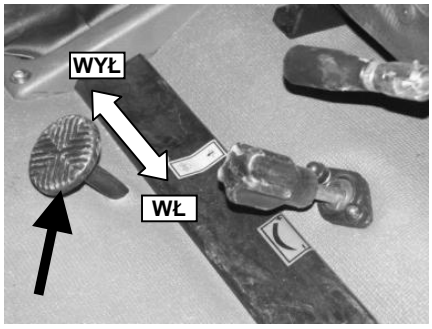


It is forbidden to use the brake to stop the tractor during driving. An exception is an emergency situation when during driving, without previous fault symptoms, the working brake (basic brake) will be dameged.
The parking brake is swittched on through pulling the lever upwards. In order to release the brake lever you must slightly pull the lever upward and then press the push button **1** located at the end of the lever and lower the lever fully downwards. (**fig. D-15**)

Fig. D-15 Parking brake.

INTERLOCKING OF DIFFERENTIAL GEAR

Do not switch on interlocking of differential gear at velocities over 10 km/h and on turns – it can impede driving the tractor.



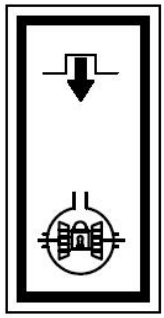


Fig. D-16 Controlling the interlocking of differential gear of the rear axle assembly (the pedal of interlock is located in the cab floor)

The pedal of interlocking of differential gear (fig. D-16)– possesses two positions:
1 (upper position) – interlocking switched off – the tractor can move during transportation on hardened roads and in field conditions on base ground (soil) with good adhesion.
2 (lower position) – interlocking switched on - you must use during performance of field or transport works in situation when drive wheels skid and it threatens getting stuck of the tractor.

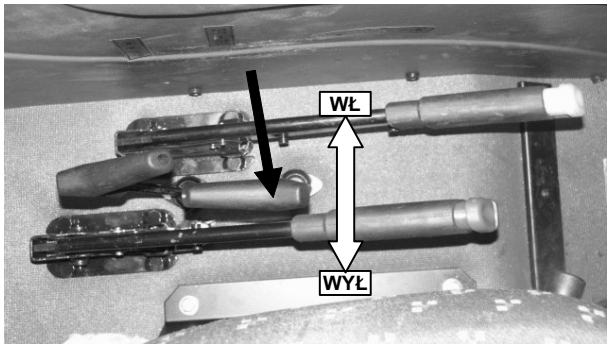
ATTENTION ! It is allowed to switch on the interlock of differential gear at field and transport works during increased skid.

SWITCHING ON OF THE INTERLOCKING OF DIFFERENTIAL GEAR AT TRANSPORT WORKS ON HARDENED PAVEMENT AND AT TURNING OF FRONT WHEELS OVER 18° IS FORBIDDEN

Non compliance with above mentioned rules shortens the period of failure-free operation of driving system and impedes driving the tractor. Use the switched-on interlocking for a short time – in order to overcome road obstacles.

DRIVE OF FRONT AXLE

Drive must be switched on:
- when there is necessity of ovecoming momentary resistances on hardened roads and hard subsoils,
- during field works when there are bad traction properties of subsoil (high humidity, covering with remains of vegetables, loose subsoil etc.),
- at field works, when the aggregated machine (tool) requires large towing forces,
- when using front axle for braking the tractor.



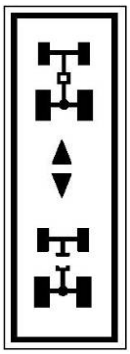


Fig. D-17 The lever of controlling the front axle can be set in two positions:
WŁ /ON/- drive switched on (upper).
WYŁ /OFF/ - drive switched on (lower);

ATTENTION !

It is forbidden to switch on drive during driving on hardened roads.

It is forbidden to use the switched-on drive of the front axle at velocities over 15 km/h or or at turn of front wheels over 25°.

In case of necessity of using the front axle drive during driving with back gear you must use the switched-on drive for a short time.

During exploitation of the tractor with front loader, shifting of switch into position of of the switched-on drive may cause damage of driving chain elements of the front axle.

REAR POWER TAKE OFF SHAFT (PTO)

The PTO of the tractors **ZEFIR** can drive cooperating machines with rorational speeds:
- independent (from speed of driving), 540 or 1000 rev./min
- dependent (on speed of driving). Number of revolutions per meter of road is constant, independently from this which gear is switched on.

Before connecting the machine driven from PTO you must check obligatory whether rotational speed of the PTO ending of the tractor corresponds to the required velocity of the machine shaft.

SWITCHING ON AND SELECTION OF DEPENDENT – INDEPENDENT REVOLUTIONS OF PTO DRIVE

In order to eliminate dynamic loads in the system of transfer of PTO drive you must, when switching on PTO shaft drive, decrease revolutions of the engine to 900 rev./min. Increase rotational speed to the required speed after switching on the PTO drive. Before switching off the PTO drive you must also decrease revolutions of the engine. It is especially important during aggregation with machines with large moments of inertia. such machines should be equipped with unidirectional clutch.

Non-compliance with the above mentioned recommendations may lead to premature wear of PTO drive transmission system elements and in consequence increase frequency of conducting regulaation or replacement of parts.

In tractors **ZEFIR** the PTO drive is switched on with the lever **1** of the PTO clutch and the lever **2** for selection of PTO operation mode.Levers are located at the left side of the seat **(fig. D-18)**.

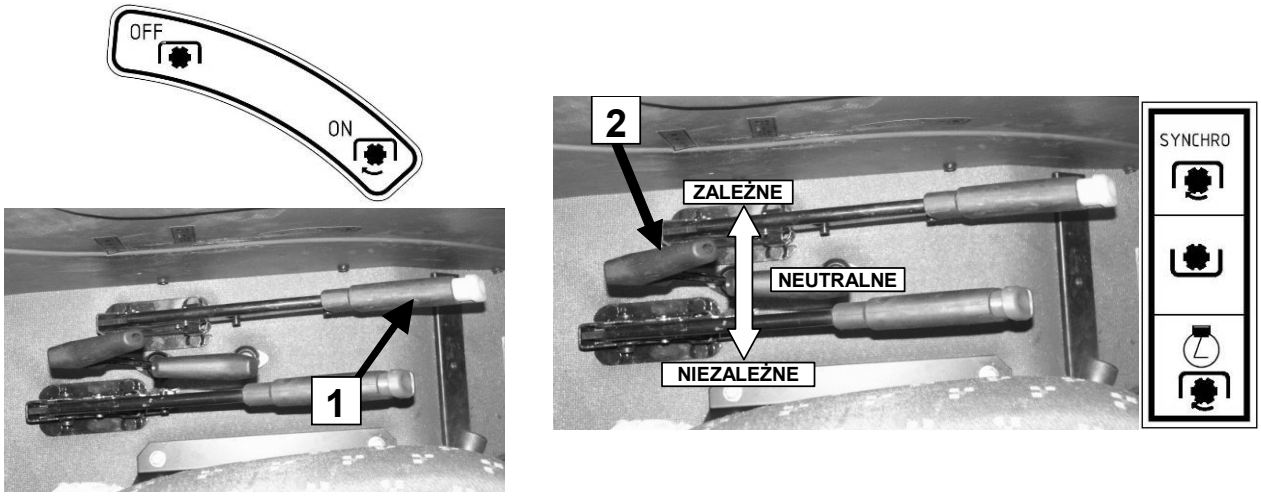


Fig. D-18 The lever **1** of the PTO clutch and the lever **2** for selection of PTO operation mode (dependent-neutral-independent) in tractors **ZEFIR**.
OFF- PTO clutch disconnected; **ON**- PTO clutch connected
DEPENDENT (upper position)– PTO shaft revolutions dependent on tractor driving speed
NEUTRAL (middle position) – PTO shaft revolutions switched on
INDEPENDENT (lower position) – PTO shaft revolutions independent fromtractor driving speed (dependent on rotational speed of the engine shaft)

You must select kind dependent – independent revolutions at the switched off PTO drive (the switched off PTO clutch).

In order to **switch on the PTO** you must switch off the PTO clutch pulling the lever **1** of the PTO clutch upward (according to the pictogram placed next to the lever) into the position **OFF** (SWITCHED OFF)until the moment of catching the pawl and shift the lever **2** from the neutral position into the posiotion of dependent or independent revolutions. After selection of PTO operation mode (dependent – independent) you must shift the lever **1** of the PTO clutch into the position **ON** (SWITCHED ON). For this aim you must slightly puu the lever **1** upwards and next press the push button located at the end of the lever and lower the lever slowly downwards totally switching on the PTO shaft drive.

During lifting the machine (tool) suspended on the tractor TPSS, driven from the tractor PTO, you must absolutely switch off the PTO drive when being on returns.

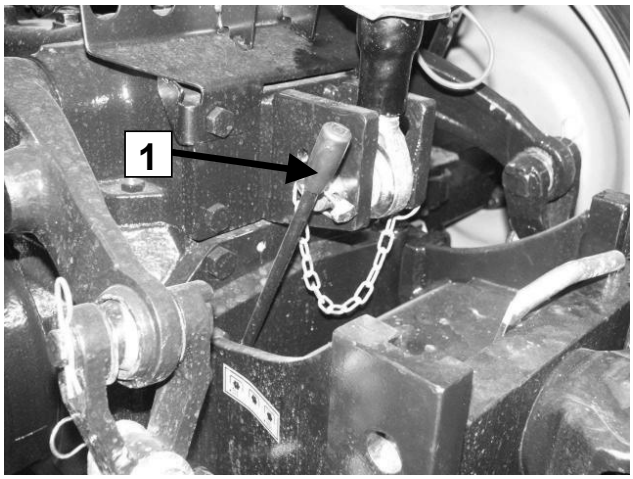
For **short-lived switching off the PTO** you must pull the lever **1** of the PTO clutch uprwards and disconnect PTO clutch. In order to switch on PTO again you must press the push button located at the end of the lever and lower the lever slowly downwards totally switching on the PTO shaft drive.

In order to avoid accidental starting the machine driven from the tractor PTO , you must, at each break in operation of the machine, switch off the PTO drive. Switch off the PTO drive at each return and during lifting the machine being suspended on the TPSS (the lever 1 fig. D-18)

For **long-lasting switching off the PTO** you must switch off the PTO clutch pulling the lever **1** of the PTO clutch upwards (according the pictogram placed next to the lever) into the position **OFF** (SWITCHE D OFF) until the moment of catching the pawl and shift the lever **2** from the position of dependent or independent revolutions to the neutral position. After shifting the lever **2** into the **NEUTRAL** position you must shift the lever **1** of the PTO clutch into the position **ON** (SWITCHED ON). For this aim you must pull the lever **1** slightly upwards and next press the push button located at the end of the lever and lower the lever slowly downwards totally.

SELECTION OF ROTATIONAL SPEED OF THE INDEPENDENT PTO

Selection of rotational speed of the independen PTO must be conducted when the PTO drive is switched off.



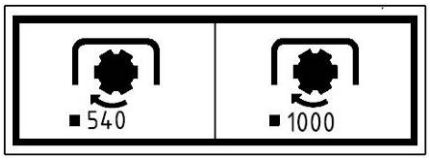


Fig. D-19 Lever for switching on proper rotational speed of PTO: 540 or 1000 rev./min. (it is located outside the cab in the rear of the tractor)
1- the lever for selection of the range of PTO rotational speed;

In order to conect proper rotational speed **540, or 1000 obr/min** of PTO you must shift the lever **1** (**fig. D-19**)
- **forward** if we want to select revolutions **540 rev./min**
- **backwards** if we want to select revolutions **1000 rev./min**

according the pictogram placed next to the lever.

Type of PTO	Rotational speed [min^{-1}]		Transmitted Power
	PTO	Engine	
Rear PTO	1000	2087	56 kW (76 KM)
	540	2016	

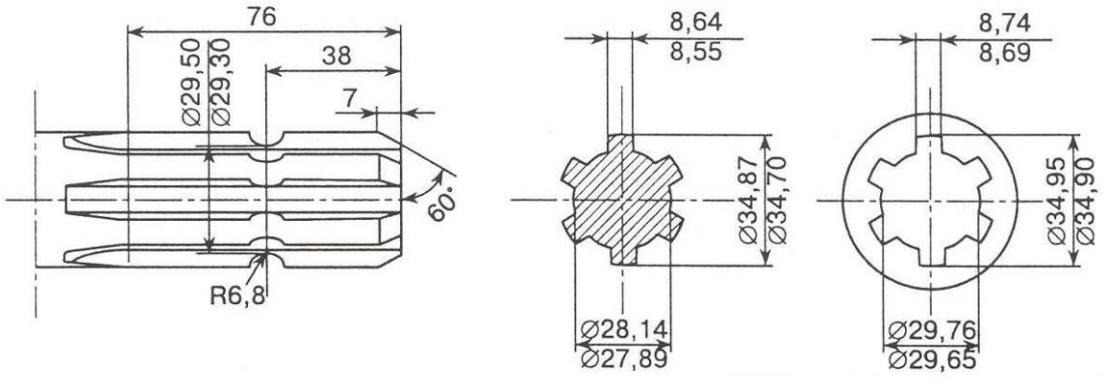


Fig. D-20. Dimensions of the PTO shaft in tractors **ZEFIR** – type I acc. to the standard PN-ISO 500

CONNECTING OF EQUIPMENT DRIVEN BY PTO

Before connecting and disconnecting the machine driven by PTO you must:
- pull firmly the parking brake
- make sure whether all levers for changing gears are in neutral positions
- switch off the engine before leaving the tractor cab

After leving the cab by the operator you must connect the machine to the TPSS in the manner described in the chapter ”THE REAR THREE POINT SUSPENSION SYSTEM”.

ATTENTION: During aggregating of machines driven from the PTO shaft the upper transport hitch should be fastened in upper extreme position or dismounted. The manner of dismounting of the hitch has been described in the chapter „HITCH DEVICES”.

Before connecting and disconnecting the machine driven by the PTO the upper transport hitch should be fastened in upper extreme position or dismounted.

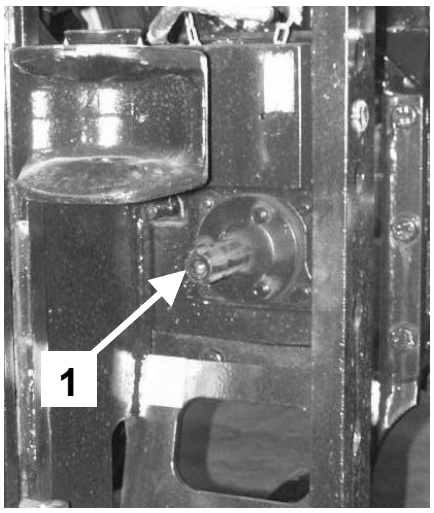


Fig. D-21 PTO shaft ending

Next you must take out the plastic cap from the ending of the PTO shaft WOM **1 (fig.D-21)** and connect the jointed shaft to the PTO ending.

When the tractor engine is stopped the PTO shaft ending can be turned manually in order to align splines on the PTO ending with the machine shaft. After pushing the ending of the jointed shaft onto the ending of the tractor PTO you must make sure whether the pin of intelocking of drive shaft has jumped into the groove of the PTO ending. Secure the housing of the jointed shaft against twisting by means of a chain.

After connecting of suspended machine you must lift and lower the machine, check clearances and range of shifting of the jointed and telescopic shaft. When the machine is engaged to the agricultural hitch you must check whether the hitch is positioned correctly.

In case the PTO shaft ending is not used you must put the plastic cap on it.

During driving the machine by the PTO you must make sure whether the housing of the PTO shaft is installed.

During using equipment driven by PTO you must not wear loose clothing.

Do not clean, do not regulate, do not approach the equipment driven by PTO when the engine is running.

STARTING THE TRACTOR

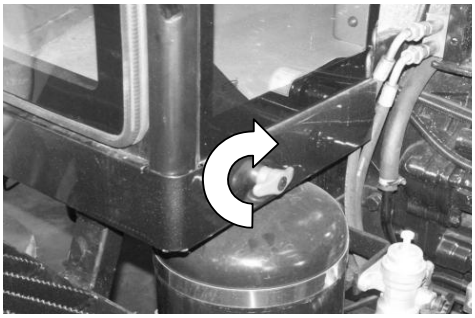
Before driving or starting work with the tractor you must get acquianted with guidelines concerning precautions contained in the chapter B. SAFETY CONDITIONS" of this servicing instruction

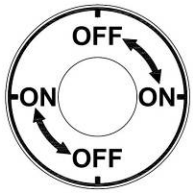
Before starting a new tractor or a tractor which has not worked for a long time you must check oil level in the engine an in remaining subassemblies of the tractor as well as you must check the fluid level in the brake and cooling system.

ATTENTION! It is FORBIDDEN to start the engine without cooling fluid in the cooling system.

Before starting the engine make sure that all protective housings are in their places and whether they are fastened properly.

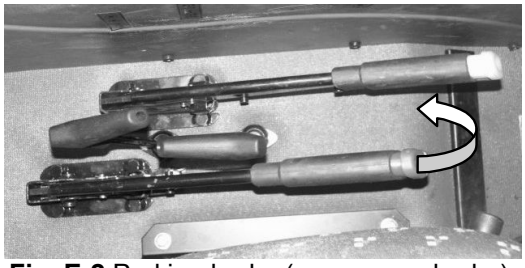
Before starting the engine you must perform the following actions:





• switch on the battery switch located with the battery on the right side of the tractor.

Fig. E-1 The battery switch outside the tractor on the right side of the tractor.



• brake the tractor with the parrking brake **(fig. E-2)**;

Fig. E-2 Parking brake (emergency brake).

• make sure whether the lever **A** (fig. **E-3**) for controlling change of gears and the lever **B** for controlling selection of group of gears are in the position **N**. (pay attention to the diagram for controlling the geearbox located on the handle of the lever).

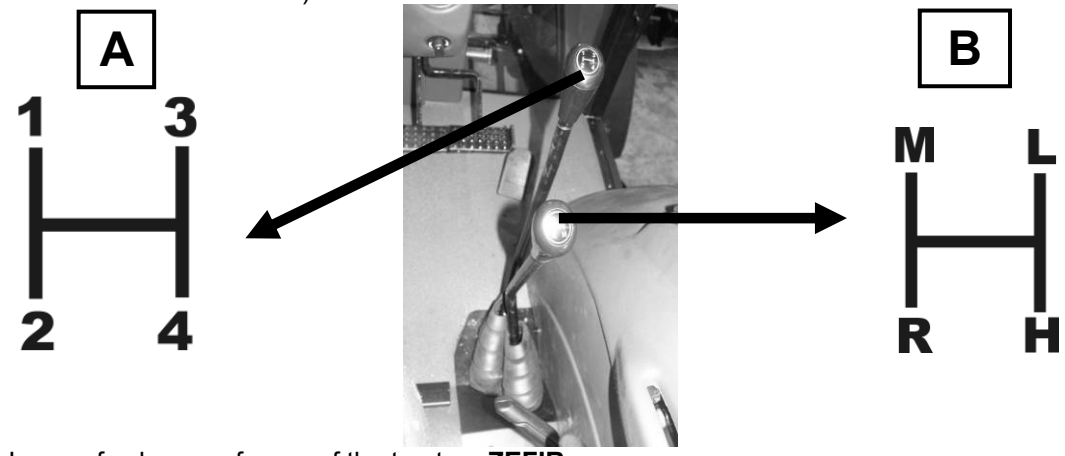
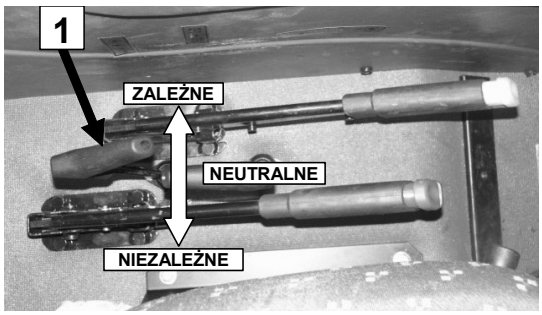


Fig. E-3. Levers fo change of gearsof the tractors **ZEFIR.**
A – the lever for change of gears and the diagram for controlling the lever of change of gears;
B – the lever fo selection of group of gears and the diagram for controlling selection of group of gears

• make sure whether the PTO is switched off **(fig. E-4; position NEUTRAL**) and whether the controlling levers of external hydraulics are in neutral position



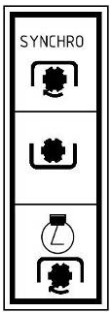


Fig. E-4 Lever **1** and pictogram for switching on the PTO in tractors **ZEFIR**
NEUTRAL (middle position) – PTO switched off

• the lever for controlling fuel charge ”gas” (**fig. E-5**) must be set in position of feeding

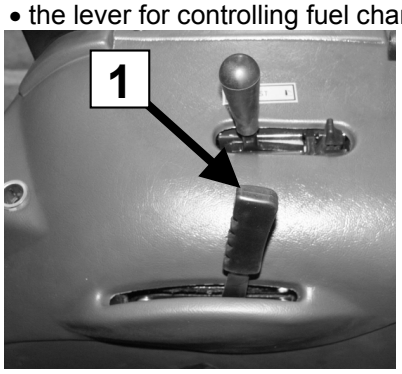


Fig. E-5 Lever **1** for controlling fuel charge „gas” (on the right side of the seat).

• disconnect the clutch- by pressing its pedal in full;

ATTENTION ! The tractor possesses interlocking of the starter – if the pedel is not pressed – switching on the starter is not possible.

- turn the key of the inignition switch into the position **1 (fig. D-6)**, and next press the key into the position **2.**

The tractor engine must be started by turning the key from position **1** to position **2** (fig. **D-6**) for the period of maximum 15 s. If the engine is not started, you must repeat attempt. It is recommended to conduct maximum of three attempts with breakes of 30 ÷ 40 seconds. If the engine has not been started you must find fault and eliminate it.

In case of **starting the engine in low temperatures** you must turn the key of the ignition switch into position **1** and wait until the control lamp concerning functioning of the system for support of starting in low temperatures goes out, on the panel of indicators (**fig. D-3**). After the lamp has gone out you must press the key and turn it from position **1** into position **2**.

Always start engine from operator’s seat !

- observe correctness of indications of measuring and control devices (oil temperature,temperature of cooling fluid, oil pressure in the engine etc).

ATTENTION ! It is forbiddent to start the tractor (engine) by towing.

It is forbidden:
- **to switch off the battery switch (fig. E-1) when the engine is running;**
- **to exploit the tractor without batteries.**

- after starting, release pressing on the clutch pedal

MOVING FROM PLACE

ATTENTION! Before starting to work with the tractor you must check functioning of the engine, steering system, brake system and remaining systems and assemblies of the tractor.

The engine should run stably within the whole range of rotational speeds.

Control elements, steering system, brakes, lighting and signalling installation, wipers of windows should be operational and should be in good technical condition.

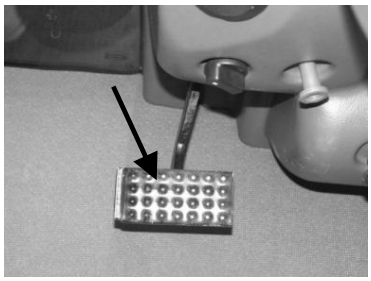


Fig. E-6 Clutch pedal.

Moving from place you must perform the following actions:

- press the clutch pedal until resistance (**fig**. **E-6**);
- release the parking brake switched on previously;

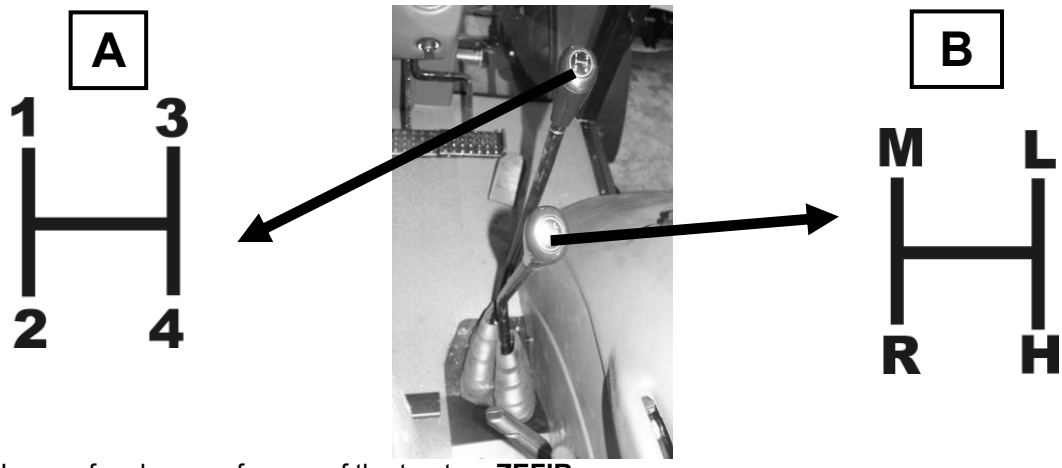


Fig. E-7. Levers for change of gears of the tractors **ZEFIR.**
A – the lever for change of gears and the diagram for controlling the lever of change of gears;
B – the lever for selection of group of gears and the diagram for controlling the lever for selection of group of gears

- by means of the lever for steering selection of group of gears according to the diagram **B** (**fig. E-7**) you must switch on the selected group of gears **„H" (fast gears)**; **„M" (normal gears)**; **„L" (slow gears)** or **„R" (reverse gears)**.

ATTENTION: Switchng of gears„H – M – L - R" should take place only after total stopping of the tractor.

- by means of the lever for controlling change of gears according to the diagram **A** (**fig. E-7**) you must switch on the selected gear „**1, 2, 3 or 4".**

ATTENTION: Switching of gears „1, 2, 3 or 4" can take place during driving of the tractor.

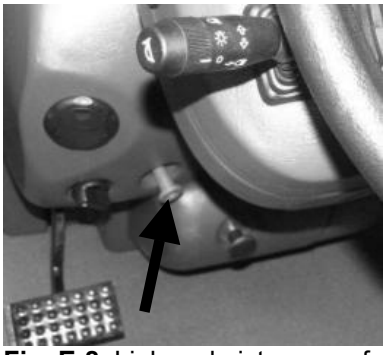
- you must switch gear through fluent motion, without jerking the lever. If automatic switching-on of the gear does not take place, you must shift the lever into neutral position also through fluent motion, release slightly press on the clutch pedal, and next press to resistance and switch on the gear.Similarily you must procedure in case of operating the lever for controlling selection of group of gears.
- fluently and slowly press the „gas" pedal (increasing rotational speed of the engine), also release press on the clutch pedal through fluent motion;
- after releasing press on the clutch pedal you must remove the leg from the pedal;
- further switching of gears should take place during driving after pressing the clutch pedal to resistance.

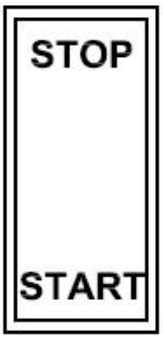
STOPPING THE ENGINE AND THE TRACTOR

Stopping the tractor requires:

- lowering the rotational speed of the engine;
- pressing home the clutch lever ;
- changing the gear lever **A** (**Fig. E-7**) into neutral position (**N**);
- pedaling the working (main) brake;
- after stopping the tractor, gearing the parking brake with use of hand-lever (**Fig. E-2**).

In case of <u>emergency</u> stop, pedal the <u>brake and clutch</u> at a time.

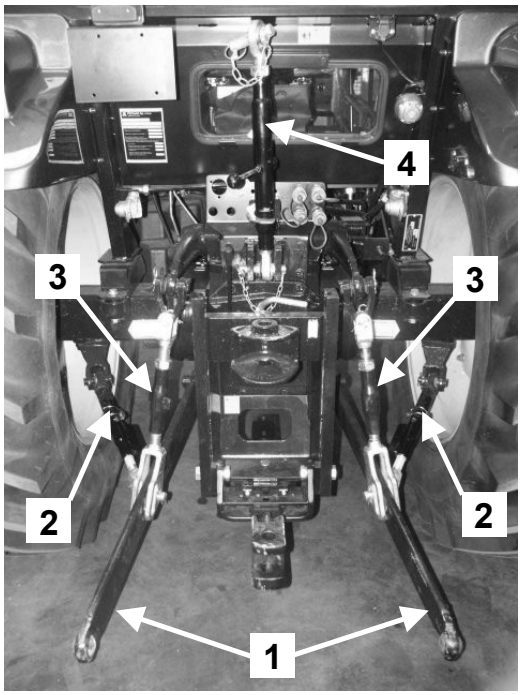




One must not stop the negine at high temperature of the lubricating oil and cooling agent. It is recommended working at low rotational speed of the engine until having the oil and the cooling agent lowered. Stopping the engine requires switching the hand lever of conrol of the fuel dose (**Fig. E-5**) into “minimum” position, and then pull the „STOP” link of the engine (**Fig. E-8**) and in case of close-down, switching the battery off (**Fig. E-1**). Signal lamps on the switchboard should go out.

Fig. E-8. Link and pictogram of stopping the engine „STOP”

REAR THREE-POINT HANG-UP SYSTEM



STRUCTURE

Tractors **ZEFIR** are equipped with three-point hang-up system for tools, which connection dimensions correspond with 2 categories of hanging-up according to the ISO-730 standard. Three-point hang-up system enables coupling hang-up and half-hang-up tools with the tractor, their operation and controlling their operation by means of hydraulic system.

Lower links are lifted up and let down by means of hangers **3**, connected with arms of lifting appliance. Hangers are easily adjustable and enable proper positioning tools with relation to the tractor.

Upper link **4** is attached to the bracket on the middle cover of the rear axle. The rear part of the upper link must be attached to the upper draw bolt of the tool that is to be hang-up. Upper link is also adjustable, which faciliates positioning the tool.

Fig. E-9 Three-point hang-up system – structure.
1 – lower ball links, **2** – low links limiters; **3** – hangers; **4** – upper link;

ACCOUPLING MACHINES (TOOLS)

Machines (tools) are being hung-up (accoupled) with the tractor in three points: two joints of lower links **1** and in upper link, through upper link **4**.

Before accoupling the equipment one must adjust hangers **3** and make sure whether telescopic limiters **2** are mounted and properly adjusted. Dismantle the hook-type coupling or upper transport coupling, if need be..

Before setting about accoupling machines or devices, one must pull the parking brake.

Accoupling

Most of tools can be accoupled to the tractor in the following way:

1. Position the tractor, so that coupling joint of lower links be levelled and positioned in the axis of coupling pins of the tool.
2. Attach the tool to lower links.
4. Having the parking brake pulled and actuated, adjust the upper link so that the bracket pin of the tool could pass through the bracket and upper link.
5. Connect the external hydraulic piping, if necessary.
6. After having the tool accuopled and before setting about working, check whether the accoupled tool does not run against any part of the tractor.

ATTENTION:
When accoupling hung-up or half-hung-up tools with three-point hang-up system or with transport coupling of hook-type coupling, make sure that there is enough clear width between the tool and the tractor (cab, back window, tyres) at any tool position. If need be, adjust telescopic limiters.

In order to detach the machine (tool) from three-point hang-up system, one must:

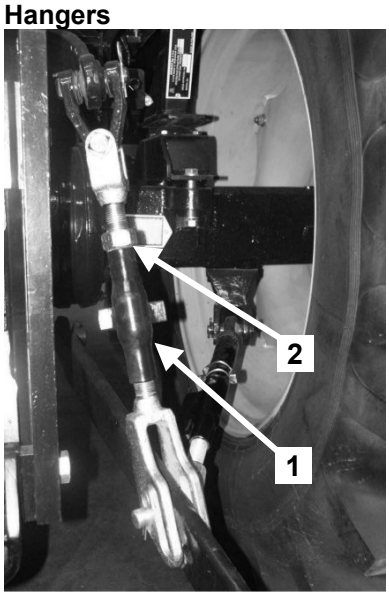
1. lower the tool, making sure that it will no fall down after having it detached from the tractor;
2. detach the upper link of three-point hang-up system
3. detach lower links of three-point hang-up system
4. lower the lower links completely and drive the tractor forward.

When detaching, one must observe following precausions:
- always leave the tool on hard and level ground
- support the tool so that would not fall down after having is detached from the tractor
- always reduce the pressure in the servomotor of three-point hang-up system before detaching.

ADJUSTMENTS

When accoupling tools with three-point hang-up system one can take following adjustment actions:

Hangers



Adjusting hangers consists in turning the central part of the hanger **1 (Fig. E-10)** on stretching screw.
Before setting about turning stretching screw, it is necessary to loosen the locknut **2**, located in the upper part of the hanger. Then, turn the central part of the hanger in order to lengthen or shorten the hanger unit. After having the adjustment procedure completed, tighten the locknut to protect the central part of the hanger against accidental turning.

Fig. E-10 Hanger of three-point hang-up system **1**- central part of the hanger along with the handle; **2**- locknut

Hangers of three-point hang-up system can be attached to its lower links in two ways **(Fig. E-11)**:
1. to round-shaped openings while lower links (and its joints) cannot change its position with relation to the hanger. Such coupling way is used when working with automatic adjustment option.
2. to bean-shaped opening. At that time there is a possibility of changing the position of lower links with relation to the position of the hanger. It allows to compensate mutual movements of the tractor and machine (tool), especially when working at large working width, in transverse plane with relation to the driving direction of the tractor.

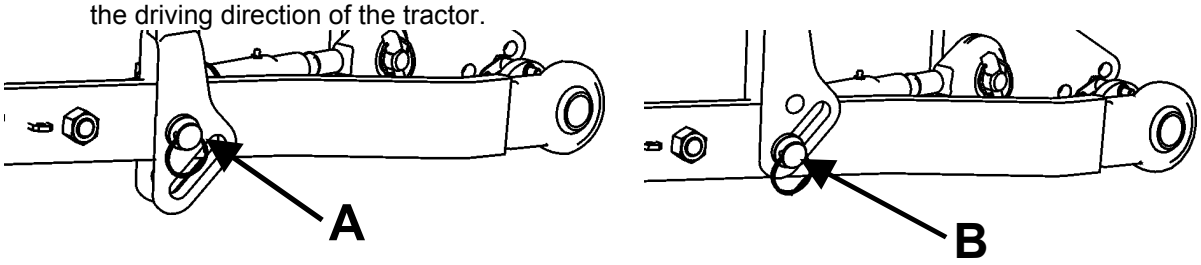
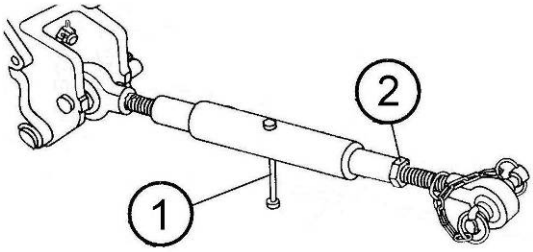


Fig. E-11 Two ways of accoupling hangers with lower links.
A –hanger of three-point hang-up system mounted in round-shaped opening;
B – hanger of three-point hang-up system mounted in bean-shaped opening.

After having the way of coupling of hangers changed, secure the pins of lower link, that fix hangers, with original cotter pins.

Upper link



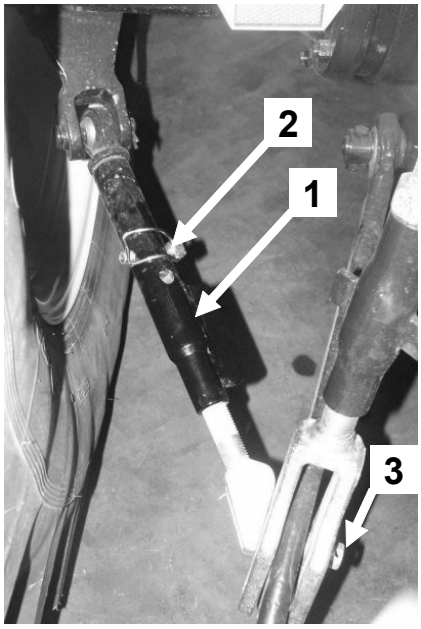
Structure of the upper link (stretching screw) allow for its lengthening or shortening (by turning the central part 1 (**Fig. E-12**), depending on need. After having the link adjusted, tighten the contra-nut **2**, securing against changing its length.

Fig. E-12 Adjusting the upper link of the three-point hang-up system.

When adjusting upper link, one must mind its endings were advanced from the pipe on equal length and locked with locknut 2.

In case the upper link is disused, one can dismantle it and leave it in vartical position after having it secured in the bracket.

Limiters



Limiters (Fig. E-13) modulate oscillation of lower links and accoupled equipment when working or transporting. It is particularly important while working on slopes or along fencing or ditches and while using some tools.

Fig. E-13 Limiters of lower links of three-point hang-up system; 1 – lower link limiter; 2 – fixing cotter pin; 3 – clamping cotter pin

ATTENTION: When setting the length of telescopic limiters, one must make sure that there will not be any conflict between tyres and limiters or lower links.

ATTENTION: Limiters transfer only compressive forces, they do not transfer tensile forces. In case the tensile force produces effect on the limiter, the cotter pins, that attach limiters to lower links, may be broken off (Fig. E-13, item 3).

For example, when the tractor works with the plough, one must take following adjustment actions of in relation to three-point hang-up system:

- the tractor when ploughing have right (usually) wheel in the furrow, one must level the plough arm (shortening of lengthening the right hanger), because in relation to the surface of the field, the tractor leans out to the right;
- so that the depth of the first and the last body were same, one must (after having it levelled) change the upper link length by means of knob **1** (**Fig. E-12**), after having the locknut 2 unscrewed. When the adjustment procedure is finished, tighten the locknut **2**.

While driving the tractor withe the machine (tool) hung-up on it, one can shorten the upper link in order to make the clearance of the accoupled unit larger.

COUPLING UNITS

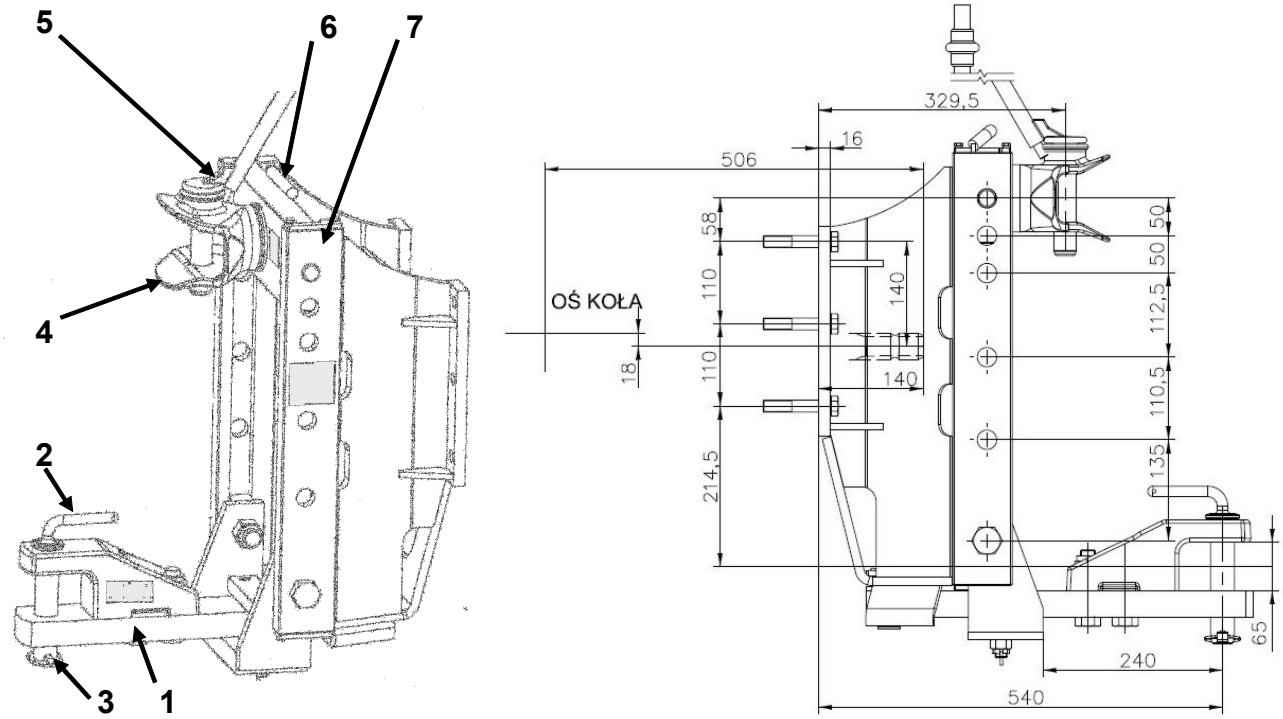


Fig. E-14 Coupling devices of **ZEFIR** tractros – structure and dimensions.
1 – hook-type coupling; **2** – pin of hook-type coupling; **3** – cotter pin of of hook-type coupling; **4** – transport coupling; **5** – pin of transport coupling; **6** – adjustment lever of transport coupling in vertical position; **7** – guide rails of adjustment device of transport lever in vertical position;

UPPER TRANSPORT COUPLING (item 4; Fig. E-14)

Upper fork-type transport coupling is designed for coupling biaxial trailers or farm machines built up on chassis of such trailer with the tractor.

There is a possibility of changing the position of coupling in vertical plane. When accoupling machines driven by the power take-off shaft, the upper transport coupling should be mounted in upper utmost position or disassembled.

In order to change the position of transport coupling in vertical plane, one must pull the lever **7** up until the lock pins go out of the guide openings **8**. after having that action taken, one may freely move the upper transport coupling at desired height. In order to fix the coupling in desired position, one must pull the lever **7** down to make the pins fit to appropriate openings on the guide **8** and locked the transport coupling at desired height.

ATTENTION: If necessary, one can totaly dismantle the upper transport coupling by pulling the lever **7** and drawing it totaly out of guides **8**.

In order to accouple the tractor with the trailer, one must unlock the pin **5 (Fig. E-14)** and take the pin out of the opening of coupling fork **4**, and then by leading the trailer eye towards coupling fork, connect it by means of the pin **7** with the tractor coupling and secure with lock

In order to disconnect the tractor and the trailer, one must unlock the pin by means of sleeve **6**, take the pin out and drive away.

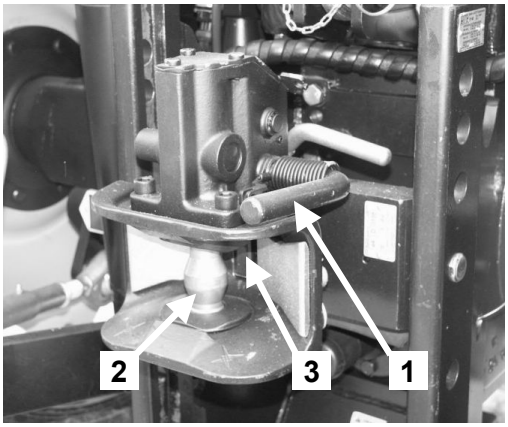
IT IS TOTALLY FORBIDEN TO:
- accouple with upper transport coupling uniaxial trailers or farm machines built up on chassis of such trailers, exceeding vartical carrying capacity.

Attention!
It is forbiden to accouple with upper transport coupling trailers and farm machines equipped with rotational draught-bar.

Maximum vertical force acting on upper transport coupling cannot exceed the value of 20 kN (2000 kg)

Maximum weight of trailers accoupled with the upper transport coupling must not exceed the value of 10700 kg

AUTOMATIC-TYPE UPPER TRANSPORT COUPLING (OPTION)



Tow pin **2** of the automatic-type transport coupling being at lowered position is loaded with a spring. When connecting the trailer one must lift the tow pin up (retract it to the cover side) by means of lever **1**. Then one must direct the draught bar eye of the trailer towards trigger lever **3**. Hitting the eye against lever **3** will cause hte pin collapses and the draught bar of the trailer and tractor coupling will be connected.
In order to disconnect them, one must once again lift the lever **1** up.

Fig. E-15 Automatic-type upper transport coupling (option). **1** – coupling lever; **2** – coupling pin; **3** – trigger lever;

Do not touch the trigger lever 3 (Fig. E-15) with hand, because the tow pin may hurt your hand when dropping down.

Maximum vertical force acting on the automatic-type transport coupling must not exceed the value of 20 kN (2000 kg)

IT IS TOTALLY FORBIDEN TO:
- accouple with upper transport coupling uniaxial trailers or farm machines built up on chassis of such trailers, exceeding vartical carrying capacity.

Attention!
It is forbiden to accouple with the automatic-type transport coupling trailers and farm machines equipped with rotational draught-bar.

Maximum weight of trailers accoupled with the automatic-type transport coupling must not exceed the value of 10700 kg.

HOOK-TYPE COUPLING (item 1; Fig. E-14)

ZEFIR tractors are supplied with hook-type coupling **1** mounted (**Fig. E-14**), that is designed for accoupling hooked on machines. Basic dimensions of the hook-type coupling are given in the **Fig. E-14.**

Maximum vertical force acting on the hook-type coupling must not exceed the value of 15 kN (1500 kg).

Maximum weight of trailers accoupled with the hook-type coupling must not exceed the value of 13000 kg.

STEERING WITH LIFTING APPLIANCE DURING WORK

ZEFIR tractors were equipped with possibility of steering with lifting appliance depending on agrotechnical requirements, soil (crop) state, properties and technical parameters of the machine (tool) that is to be accoupled.

Lifting appliance of tractors **ZEFIR** can work with machines (tools), that need following adjustments:

1. copying – the machine (tool) equipped with wheel copying the field surface it rolls on. Adjustment procedure consists in changing the position of copying wheel in relation to working elements of the machine (tool);
2. automatic: positional, force and mixed, that is used in machines (tools), that do not have copying wheels (or other copying elements). Automatic adjustment procedure ought to also exercised, when the manufacturer of the machine (tool) equips it with copying wheel (because there are tractors, that do not have option of automatic adjustment of lifting appliance), however in the manual it is recommended to perform automatic adjustment.

Using automatic adjustment (exemplary):

- positional: sowing, manuring (fertilizer distributors), math – in general for machines (tools), which working elements operate on the surface of the ground.
- force: ploughing, cultivation – in general for machines (tools), which working elements are dig deep into the soil;
- mixed: ploughing, cultivation – in general for machines (tools), which working elements are dig deep into the soil, and cultivated field is very heterogenous – changing soil resistance; mixed regulation uses advantages of force regulation, providing smooth depth limitation of the tool that is being dig deep into the soil.

Aforementioned examples of application make no absolute recommendations. One can use positional adjustment when setting about ploughing, but on the condition of having even field, because the tractor copies it and longitudinal movements of the tractor cause change of working depth. Working elements of seeders work dig deep into the soil, however positional regulation is recommended.

There are many possibilities for using regulation of lifting appliance in practice, however it requires the user to be deeply familiarized with technical advantages of used equipment (tractor, tools and machines), and also with the result he desired to obtain on cultivated field, when exercising nursing activity or when harvesting.

Accoupling the tractor with the machine (tool).

Before setting about accoupling the machine with the tractor, one must inspect the position of levers, that control outputs of external hydraulic system **1 (Fig. E-17)**. Levers ought to be positioned in neutral.

When accoupling the tractor with the machine one uses lever of positional regulation inside the operator's cab **1 (Fig. E-16)**. When changing the position of the lever **1** backwards, one can observe lifting the tool up, that is hung up on three-point hang-up system, whereat changing the position of the lever **1** forward, causes its lowering under own weight. When lower links fall down to slowly, one must apply bigger force.

When avcoupling the tractor with the machine, the lever of force regulation **2** ought to be positioned forward to the utmost (position "OFF" in the pictogram).

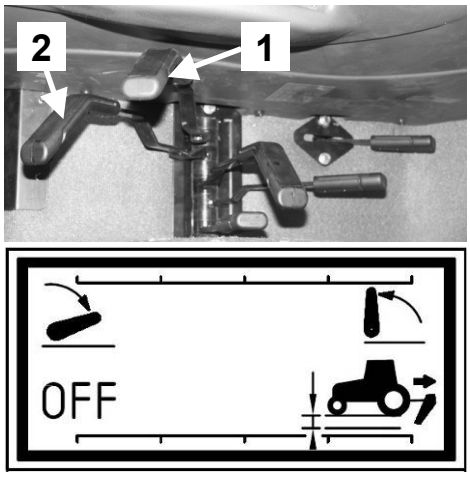
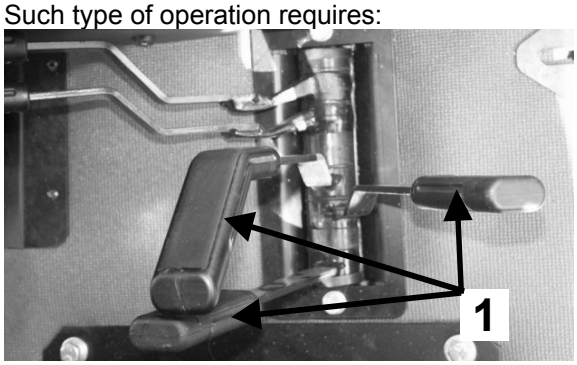


Fig. E-16 Control lever of the three-point hang-up system with pictogram.
1- positional regulation lever of three-point hang-up system; **2-** force regulation lever of three-point hang-up system.

ZEFIR tractor operation with machine (tool) at copying regulation.
Such type of operation requires:



- positioning levers **1 (Fig. E-17)** controlling outputs of external hydraulic system in „neutral" position if machines (tools) co-working with external hydraulic system of the tractor are not in use;
- positioning lever **1 (Fig. E-16)** of positional regulation of steering with lifting appliance in appropriate range;
- adjusting the copying wheel position of the machine (tool).

Fig. E-17 Levers steering with outputs of external hydraulic system.

ZEFIR tractor operation with machine (tool) at automatic-type positional regulation.

Lever **1** is designed for positional regulation **(Fig. E-16)**. At positional regulation, the force regulation lever 2 ought to be positioned in „**OFF**" position on pictogram and in this situation is not in use.

With use of lever of positional regulation **1** we set the desired height of the machine (tool) above ground or operation depth.

ZEFIR tractor operation with machine (tool) at automatic-type force regulation.

Automatic-type force regulation is most proper for machines, that need to be dig deep into soil (eg. plough, cultivator).

When working with machine, that needs to be dig deep into soil, first lower the tool with use of positional regulation lever **1** by moving the lever forward **(Fig.E-37)**, and then whie the tractor is running, by force regulation lever **2** select desired operational depth. When driving out of the furrow and in order to lift or lower the three-point hang-up system, one must use only positional regulation lever 1, leaving the force regulation lever 2 in previously set position. Then, at subsequent digging the tool deep into soil, move the positional regulation lever 1 forward to the utmost, and settings of force regulation remain unchanged.

ZEFIR tractor operation with machine (tool) at automatic-type mixed regulation

Mixed regulation uses advantages of force regulation (providing stable operation of the engine by loading the tractor with stable pull force) at simultaneous limiting changes of working depth of the tool, especially in case of heterogenous soils of unsteady resistance, thanks to positional regulation effect.

If in heterogenous soils of unsteady resistance one cannot obtain same working depth of the tool, one must reduce its working depth by means of positional regulation lever **1 (Fig. E-16)**.

Regulation of lowering speed and response time of the lifting appliance.

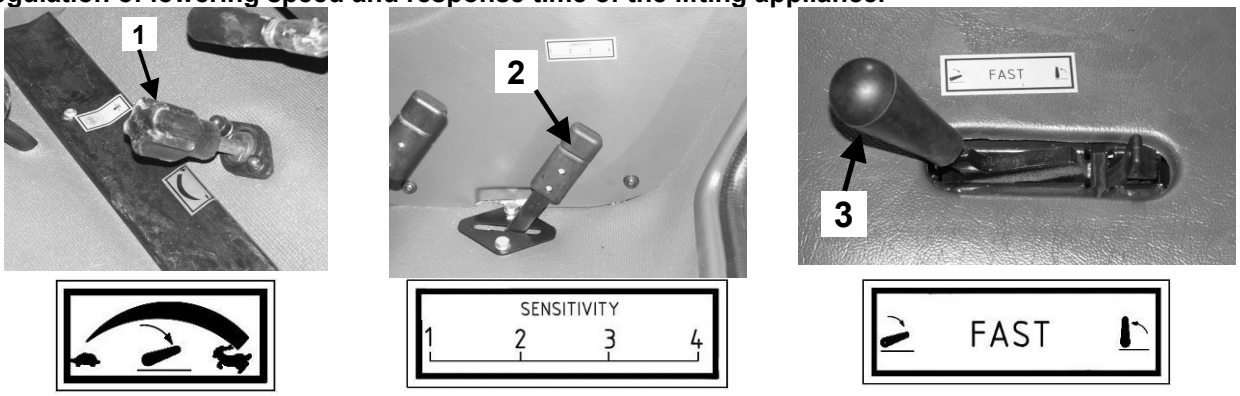


Fig. E-18 Regulatory knobs and levers of three-point hang-up system along with pictogram.
1- knob for regulation of tool lowering speed; **2**- lever for regulation of sensitivity of lifting appliance activity (response time); **3**- lever of quick lifting up and placing down the tool hung-up on three-point hang-up system.

ATTENTION: Excessive speed of lowering the tool could cause an accident or could damage the tool hung-up on three-point hang-up system.

Using knob **1 (Fig. E-18),** adjust the tool lowering speed so that it would not damage the tool. Lifting appliance lowers faster, because hung-up tool is heavy.
Turning the knob clockwise decreases the lowering speed of the tool.

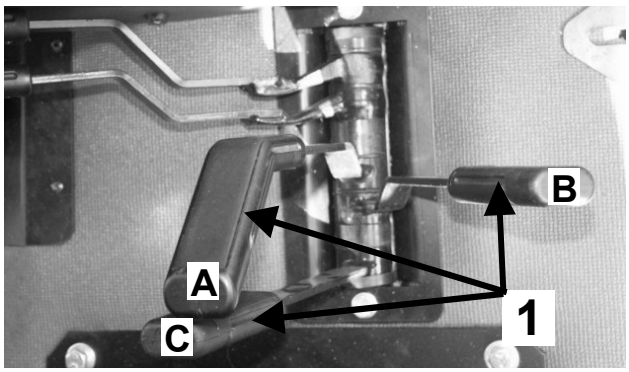
Using lever **2 (Fig. E-18)** adjust the sensitivity of the lifting appliance action (response time). In order to increase the sensitivity of the lifting appliance action, one must pull the lever backwards. Moving the lever forward decreases the sensitivity if the lifting tool action. In some cases high sensitivity could cause vibrations. In order to reduce the vibration move the lever forward little by little.

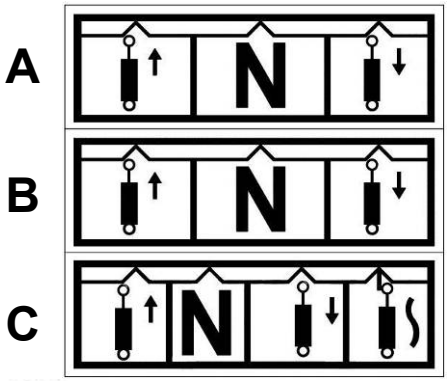
Using lever **3 (Fig. E-18)** the operator can lift the tool and then place it down, keeping the previous positioning of regulatory levers of three-point hang-up system. This way of lifting up and placing down the tool is used when returning the tractor on the field.

EXTERNAL HYDRAULIC SYSTEM

ZEFIR tractors are equipped with external hydraulic system, that enable workign with hydraulic servomotors of single and dual-action and with hydraulic equipment of constant flow. The system consists of three pairs of outputs of external hydraulic system, fitted with quick-couplers at the rear of the tractor.

All quick-couplers are controlled by means of levers located inside the tractor's cab from the right side of the operator. Next to levers there is a pictogram with symbols of levers positioning.





N - neutral (stop); - lifting up; - placing down - floating (optional)*

Fig. E-19 Levers **1** and pictograms of controlling the external hydraulic system.
A – lever controlling the first pair of quick-couplers; **B** – lever controlling the second pair pf quick-couplers; **C** – lever controlling the third pair of quick-couplers;

Each steering lever has three aftermentioned working positions:
LIFTING UP – pull the lever forward in order to draw out attached servomotor and lift the tool up
NEUTRAL – release the lever in order to select neutral position and stop attached servomotor
PLACING DOWN – pull the lever backwards, out of neutral position in order to withdraw the servomotor and lower the tool.
* FLOATING (OPTIONAL) – section C could present floating position as an option. In order to do so, pull the lever backwards out of placing down position. It allows for free movement of the servomotor in both directions, thanks to which such appliances as for example the skimming plough, gains the possibility of copying of the ground surface.

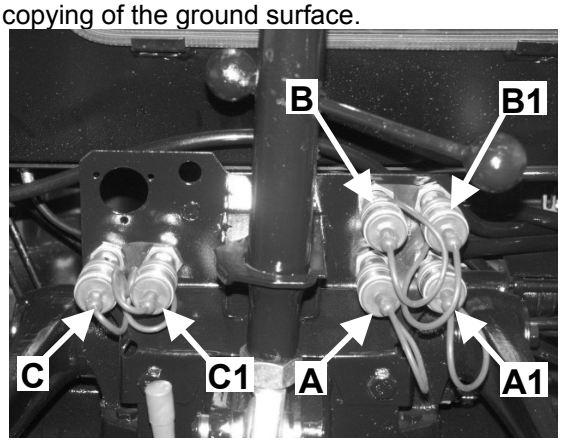


Fig. E-20. Quick-couplers of external hydraulic system **A-A1** – first pair of quick-couplers in the rear of the tractor; **B-B1** – second pair of the quick-couplers in the rear of the tractor; **C-C1** – third pair of the quick-couplers in the rear of the tractor; **A,B,C** – feeding quick-couplers; **A1,B1,C1** – return quick-couplers;

When connecting hydraulic piping check its cleannes. By connecting foul pipes you will cause that impurities will get into the tank of hydraulic system, which could cause (in spite of installed filters) failure of hydraulic system of the tractor (of pump, distributor, etc.).

Make sure whether oil in servomotors is free of dirt and of appropriate type.

Connecting one-way servomotors

One must put the plug of the one-way servomotor's cord into feeding quick-coupler **A, B or C (Fig. E-20)** making sure that it is set properly. Check whether the pipe is loose enough when turning the tractor and the tool in both directions. Actuate the control lever in order to feed the oil under pressure, which ends the process of conjugation of hydraulic systems of the tractor and the tool.

In order to draw out one-way servomotor, one must pull the lever steering with quick-coupler onwards in „lifting" position. In order to stop the servomotor before it is completely drawn out, pull the lever into neutral position.

In order to draw back the one-way servomotor, pull the lever backwards into „lowering" position. For the section "C", having the floating position, we lower the servomotor in floating position.

ATTENTION: One must not hold the lever in „lifting" or „lowering" position when the outer servomotor reaches the end of its stroke, because it will cause the overflow valve „beat". Pumping oil through overflow valve makes the oil gets overheated, which could lead to hydraulic system failure.

Connecting two-way servomotors

In case of connecting two-way servomotors, to the pair of quick-couplers **A-A1, B-B1 lub C-C1 (Fig. E-20)**, one must put the plug of feeding pipe of two-way servomotor into left feeding quick-coupler, and the plug of reverse pipe into right seat of a pair of quick-couplers designed for taking two-way action, making sure it is properly set. Check whether the pipe is loose enough when turning the tractor and the tool in both directions. Actuate the control lever in order to feed the oil under pressure, which ends the process of conjugation of hydraulic systems of the tractor and the tool.

Before setting about working with the machine, check whether moves of the machine assembly driven by external hydraulic system correspond with moves of the lever. In case they do not corresponf with each other, one must switch the coupling points of pips in the pair of quick-couplers.

In order to draw the two-way servomotor out, one must pull the lever steering with quick-coupler forward into „lifting" position.

In order to draw the two-way servomorot back, pull the lever backwards into „lowering" position.

ATTENTION: One must not hold the lever in „lifting" or „lowering" position when the outer servomotor reaches the end of its stroke, because it will cause the overflow valve „beat". Pumping oil through overflow valve makes the oil gets overheated, which could lead hydraulic system failure.

Disconnecting the hydraulic piping from quick-couplers

In order to disconnect the hydraulic pipe, one must hold it with one hand near the coupling, and put the other hand on the coupling and pull rapidly. In order to disconnect or connect quick-couplers, one must reduce the pressure in the hydraulic system. For this purpose, with the engine running place the machine into neutral position (servomotora are put away). It will cause pressure fall. Stop the engine at levers in „neutral" position. You can set about connecting and disconnecting couplings at minimum pressure and at minimum effort.

Before setting about disconnecting servomotors or tool, make sure that equipment and tool is safely supported.

It is forbiden to work with the tractor with overdriven lever of the divider in lifting or lowering position without the machine. In this position the oil flows into the tnk through overflow valve, which causes the oil gets overheated rapidly, which may lead to external hydraulic system failure.

PNEUMATIC SYSTEM FOR BRAKING THE TRAILERS

Compound pneumatic system of trailers (two- and single-pipe) consists of engine-driven air-compressor, air tank, control valves and three pneumatic joints. Joints are located in the rear of the tractor and can be coupled with single-pipe or two-pipe braking system of the trailer. Pneumatic joints are marked with three colours: black, red and yellow. Black joint is uded in single-pipe system, and red (feeding) and yellow (steering) in two-pipe system.

There are many different types of braking systems of the trailer. Before setting about connecting pneumatic braking system of the tracotr, read the manual provided by the manufacturer.

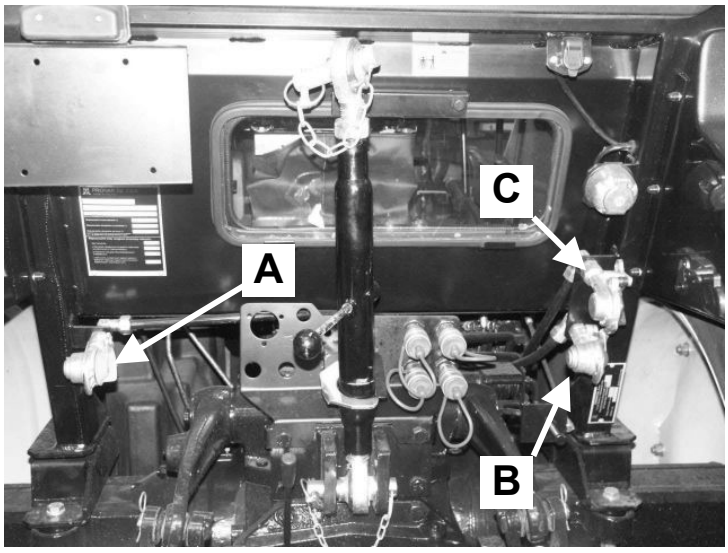


Fig. E-21. Pneumatic system joints.
A- yellow joint (two-pipe system)
B- red joint (two-pipe system)
C- black joint (single-pipe system)

ATTENTION: Brakes of the trailer operates only when both brake pedals in the tractor are pressed. For that reason one always must couple both brake pedals with pawl if you have the trailer hooked on.

The hand brake of the tractor is connected with main control valve. After switching the hand brake on, brakes in the trailer become actuated as well.

Single-pipe system of the trailer

If the trailer is equipped with single –pipe system, one must connect the pneumatic pipe of the trailer to the black pneumatic joint **C (Fig.E-21)** of the tractor. After releasing brake pedals in the tractor and parking brake lever, the pressure in the joint amounts to 0.62 MPa. Pressing brakes pedals of the tractor causes pressure fall, that is proportional to the pressing force applied on foot brakes and brakes of the trailer becomes activated.

Two-pipe system of the trailer

In the trailer with two-pipe braking system, one must connect the feeding pipe of hydraulic system to the red joint **B (Fig.E-21)**, and control pipe to the yellow joint **A (Fig.E-21)**.

Two-pipe system operates only after having both pipes connected to the red and yellow joints.

Feeding pipe (red) – it is a pipe, which fills the tank of the pnaumatic system of the trailer. If for some reason the braking system of the trailer gets disconnected from the tractor, the pressure falls to zero and trailer's brakes become activated.

Controlling pipe (yellow) – after having the brakes of the tractor activated, increased air pressure is passed through yellow joint to the control valve of the trailer, until developing full pressure in the system. The braking level of the trailer is proportional to the pressing force applied on both braking pedals of the tractor.

After actuating the engine, one must release hand and foor brake. Pressure fall signal lamp on the switchboard **(poz.2; rys D-3)** lights uo until pressure in the hydraulic system reaches value of approx. 0.5 Mpa. After reaching desired pressure ranging at 0.55÷0.8 Mpa on the air-pressure indicator **(poz.2; rys D-3)**, there could be heard loud sound of air blow off through the valve to the atmosphere.
Press the foot pedal several times, making sure that pressure measured by the control device drops after having brakes activated and rises after having brakes released.

Never drive the tractor while the brakes control lamp emits light.

Before setting about connecting pipes, clear the joints of the trailer and the tractor. While connecting make sure that joints are secured. Inspect brakes of the trailer on regular basis to make sure they work properly.

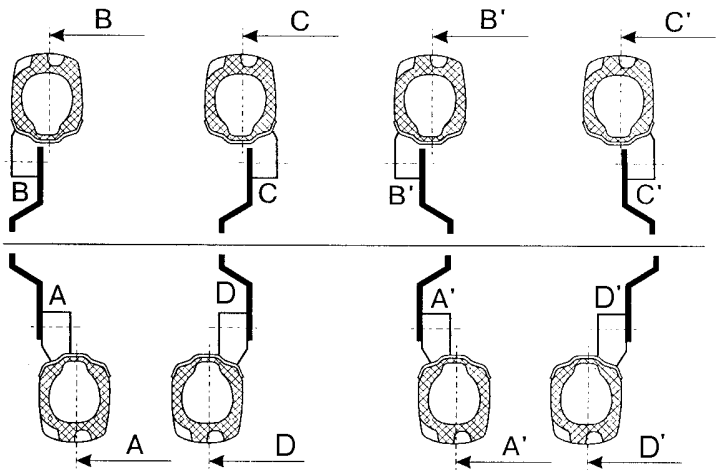
Do not overuse brakes on steep ascents. When driving downhill use the same gear that has been in use when driving uphill.

CHANGING WHEEL TRACK OF THE FRONT AND REAR DRIVING AXLE

Front and back driving axle of the tractor **ZEFIR** provides possibility of changing the wheel track depending on the way of placement of wheel disk and wheel band and by changing wheels one to another (left wheel into right side and right wheel into left side) as well as changing tyres.

Depending on tyre size and the way of placement of wheel disk and wheel band, the tractor is equipped with, there are two possible ranges of wheel track:

Front wheels: 1650-2000mm
Rear wheels: 1500-2100mm



Possibility of arranging wheel disk in relation to wheel band is shown in the **Fig. E-22**:

A (A'), C (C') – internal fixing;
B (B'), D (D') – external fixing;
C, D – shifting wheels;
A', B', C', D' – disk revolution

Fig. E-22 Way of fixing wheel band in relation to wheel disk.

When changing wheel track in case of necessity of having them shifted, one must dismantle the wheel and make a half-turn and mount from the other side of the tractor. The arrow-head placed on the tyre ought to correspond with driving direction forward of the tractor. Tread protrusion of the tyre are positioned properly and the tyre (wheel and tractor) can provide maximum towing power at particular conditions.

Wheels of the tractor are very heavy. Handling with tractor wheels needs special attention, when taking dismantling action you must secure them against falling down on you, beacuse you may get hurt.
Dismantling rear tractor wheel, due to high risk of injury, requires two man in case the operator does not have devices lowering effort (winch, traveller, fork lift truck, etc.).

After having wheels shifted, you must tighten screws fixing wheel disks to the wheel hubs, by applying force:
- front wheels: 280 Nm
- rear wheels: 280 Nm

and screws fixing wheel disks to the wheel band, applying force of 230±20 Nm

Never drive with the tractor with wheel band of wheel disk loosened. Always tighten nuts by applying recommended force in recommended period of time.

ATTENTION ! After changing wheel track, it is necessary to set the toe-in, that should amount to 0 ÷ 5 mm for wheels of the front driving axle.

RULES OF SELECTION OF WHEEL SIZE

Tractors **ZEFIR** with all-wheel drive ought to have adequately selected tyres (wheels) for the front and rear driving axle.

Dimensions of front and rear wheels appropriate for **ZEFIR** tractora, were set in the table below.

Wheels dimensions	
Front axle	**Rear axle**
11.2R28	11.2R42
14.9R24	18.4R34 **or** 16.9R38 **or** 18.4-34 **or** 520/70R34
380/70R24	16.9R34 **or** 420/85R34
13.6R24	16.9R34 **or** 420/85R34
380/85R24	16.9R38 **or** 18.4-34 **or** 18.4R34 **or** 520/70R34

If during service-time, in case of necessity (for different reasons) of changing wheels of one axle, you must check whether there is a necessity of replacing wheels of the other axle as well.

ATTENTION ! Using sets of wheels of front and back driving axle other than specified above, lead to quick tyre wear and can damage the driving system.

IMPROVING OPERATIONAL PROPERTIES OF ZEFIR TRACTORS

ZEFIR tractors were equipped with variety of devices and have numerous possibilities for improving its own operational properties, ie. increasing towing power, decreasing lost motion, and ipso facto increasing speed, which is conclusive with lowering fuel consumption per unit of tooled area.
To these devices and these ways, one can number:

- all-wheels drive;
- hydraulic jack with three-point hang-up system – the fact, that machines are hung-up on the tractor makes the rear driving axle is more loaded and thus the lost motion is decreased;
- front driving axle weights – affecting mostly improvement of stability, in case of using relatively heavy machine;
- possibility of filling in front and rear wheels with liquid (water);
- rear driving axle lock (controlled by the driver),

a) Front wheels weights (ZEFIR 85) and rear wheels weights.

In tractors **ZEFIR 85** in order to additionally load front driving axle of the tractor, that is working with heavy hung-up machines, it is allowable to mount weights – 12 pcs, 40 kg each – to the frame bracket of the tractor (**Fig.E-23**).

ATTENTION: In standard version the tractor is equipped with 6 pcs of weights, 40 kg each.

Do not use the tractor when coupling pins 1 (**Fig.E-23) and bolts 3 and 7 fixing weights are not properly placed and properly tightened.**
Any backlash between weights is not allowable.

Front weights must be used mostly for improving stability of the tractor when accuopling heavy (or with gravity center moved far back) machines (tools) with rear three-point hang-up system. In case your doings are not difficult and does not require maximum pull power, weights must be dismantled.

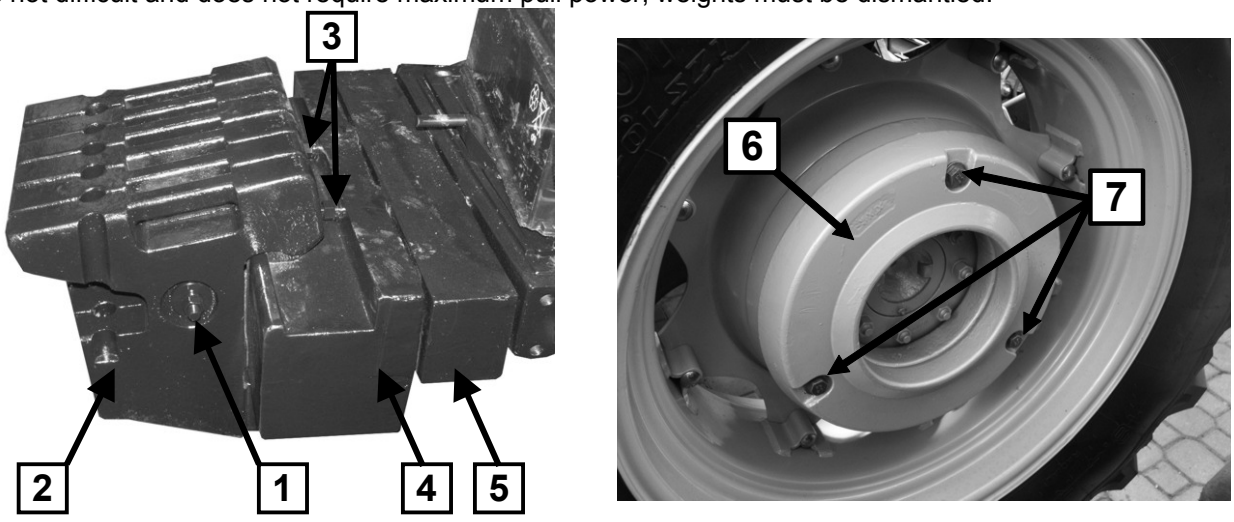


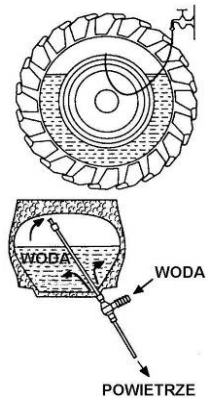
Fig.E-23 Front weights mounted to the tractor frame and rear wheels.
1-coupling pin; **2**-front weights 40kgx6pcs (40kgx12pcs - option); **3**-screws fixing bracket to the tractor frame; **4**-bracket fixing to the tractor frame; **5**-tractor frame; **6**-rear wheels weights (50kgx4pcs); **7**-screws fixing rear wheels weights.

Front load does not always provide sufficient stability if the tractor moves with high speed at uneven ground. In such circumstances you must speed down and exercise care.

Load ought to be adjusted to tyres as well as tractor bearing power. Each tyre is characterised with recommended bearing power, which you must not exceed.

b) Filling wheels up with water or with non-freezing solution.
For enlarging towing power, tractor wheels can be filled up with water or non-freezing solution **(Fig. E-24)**.

It is not recommended to fill front wheels up with water or non-freezing solution if it causes decrease in tractor stability.



When setting about filling wheels up with water, one must lift the wheel and deflate the tube by screwing out tube valve and set the blowhole in upper position. If we have special valve at our disposal, designed for filling wheels up with water, one must screw it on the tyre-valve. In case we do not have such special valve, we put the rubber hose with water under pressure, onto the blowhole (for example a rubber hose connected with water-tap). Water fills up the tube until pressurization and then one must take the hose off and let the air out of the tube. Repeat aforementioned action several times until a hole tube is filled with water, which is proven by water flowing out of the tube through valve positioned in the uppermost position. Then screw the valve unit in and fill out the wheel with air until you reach recommended tyre pressure. The amount of solution (water) in the tube ought to make 75% of its capacity.

Fig.E-24 Way of filling wheels up with water.

Before the period with temperatures below zero, you must pour the water out of wheels.

In case of necessity of having large towing power in winter time, wheels must be filled up with calcium chloride solution of concentration corresponding with ambient temperature and wheels size:

Amount of the calcium chloride in grams per one liter of water	Ambient temperature
200	do -15°C
300	do -25°C
435	do -35°C

Rear wheels	Water capacity 75% [l]
480/70 R30	380
16.9 R30	356
Front wheels	
360/70 R24	119

All actions connected with preparing the solution must be taken with rubber gloves on and due care. When preparing the solution, in consideration of safety, one must pour calcium chloride into water, not contrariwise.

c) Pouring the solution out of wheels.
In order to pour (remove) the solution out of tubes, one must:
- lift the wheel and turn it with the air-valve up
- deflate the tube and screw the valve unit out, then turn the wheel with the valve down.

ATTENTION: THE LIQUID WILL SPURT OUT!

ATTENTION: When pouring the liquid out of the tube, the negative pressure can arise inside. It is recommended to turn the wheel several times to make the valve unit be positioned up.

- the remaining amount of the liquid must be removed from the tube with use of compressed air. Remove the liquid until it stops flowing out.
- screw out the ending designed for filling up, screw the air-valve in and inflate the tyre until you reach desired tyre pressure.
- after having the wheel inflated, secure the valve with cap.
- take aforementioned actions in relation to all other tubes.

WRING SYSTEM

Negative pole (-) is connected to the tractor. Before setting about connecting any kind of receiver to the wiring system you must check its polarity and set appropriate connections.

A.C. Generator

Do not take any repair action using electric welding machine laying on the tractor or the machine connected therewith without disconnecting wiring system (both circuits) of the a.c generator.

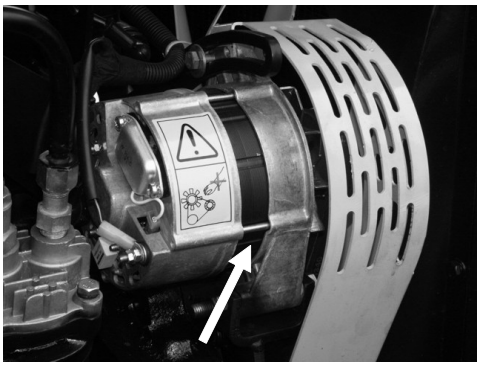


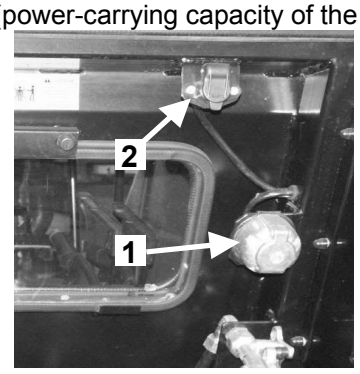
Fig. E-25 A.C. Generator

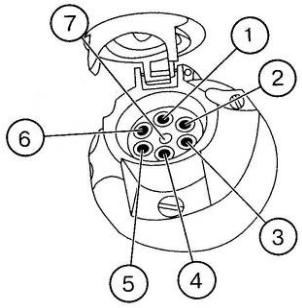
For warranting unfailing operation of the a.c. generator when taking advantage of wiring system of the tractor you must observe aftermentioned rules:

- do not take any action in relation to the wiring system when the engine is running and the battery is connected.
- do not inspect connections of wiring system elements using method of inducing sparks (shorting method);
- disconnect the battery from the „mass" when mounting or removing the a.c. generator.
- always check the polarity when connecting the battery to the wiring system and also polarity of starting batteries (transportable), used by some users for starting up in the face of low temperatures.

Wiring system joint for trailers and additional supply socket +12V

Tractors **ZEFIR** are equipped with standarized (waccording to **P**olish **N**orm) joint of the wiring system for trailers **1** and supply socket +12V for additional receivers connected to the wiring system of the tractor **2** (power-carrying capacity of the socket 10A), located on the back wall of the cab (from the outside).





To the joint of wiring system of trailers **1** (**Fig. E-26)** there are connected following units (symbols according to PN are named in brackets):

1 - (**L**) – driving direction light - left;
2 - (**+**) – sound signal;
3 - (**31**) – „mass";
4 - (**R**) - driving direction light - right;
5 - (**58R**) – position light - right;
6 - (**54**) – braking light („stop");
7 - (**58L**) – position light - left;

Fig. E-26 Joint of wiring system for trailers **1** and supply socket +12V (power-carrying capacity - 10A) for additional receivers connected to the wiring system of the tractor **2**.

Lighter seat

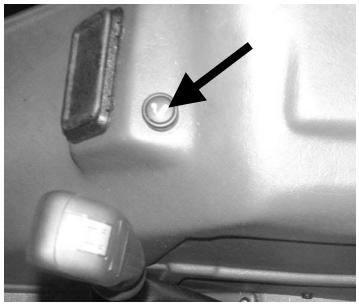


Fig. E-27 Lighter seat.

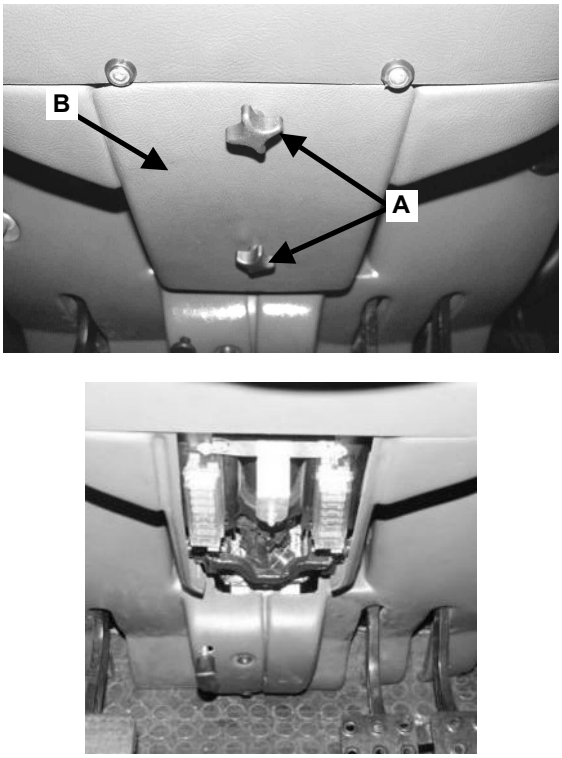
12 V lighter seat is located inside the cab on right mudguard (see **Fig. E-27**). In order to use the lighter you must press it home. When the heating element reaches appropriate temperature, the lightes will eject and will be ready for use. After taking the lighter out of its seat you can use it for connecting mobile lamp or another electrical equipment supplied with 12 V current.

ATTENTION: You must not connect high-power appliances to the lighter seat (power consumption up to 15A)

Fuses

Under the steering wheel of tractors **ZEFIR,** along steering column **(Fig. E-28)** there is a set of fuses for the wiring system of the tractor. In order to access these fuses unscrew bolts **A** and take the cover off **B**.

You must always install new fuses of appropriate parameters. When changing fuses you must always state and remove the cause of fuseblow.



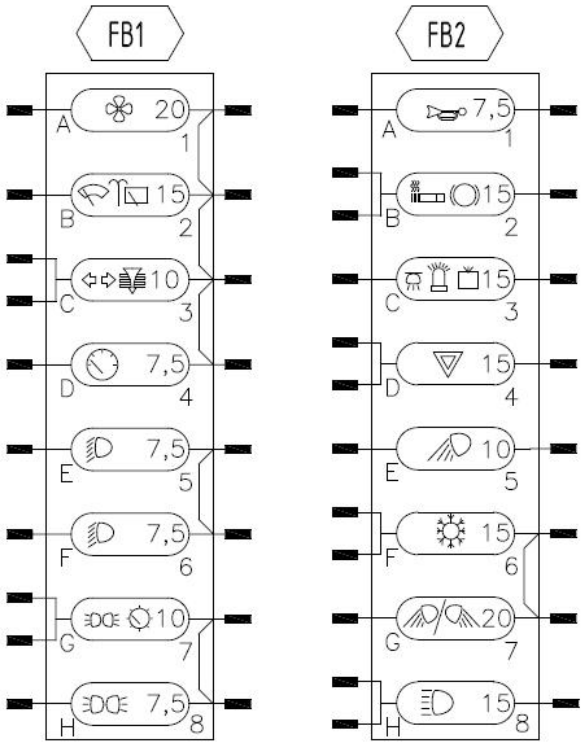


Fig. E-28 Location of fuses **FB1** and **FB2** near steering column. **A**- bolts; **B**- cover

Description of fuses in fuse-box of the steering column **(FB1** and **FB2)**:

Fuses group	No. of the fuse in Fig. E-28	Protected circuit	Value [A]
FB1	A1	Fan	20
	B2	Rear window wiper, windscreen washer and front window wiper	15
	C3	Driving direction light (left, right), air heater	10
	D4	Switchpanel supply	7,5
	E5	Passing lights of left headlight	7,5
	F6	Passing lights of right headlight	7,5
	G7	Position light from the right. Indicators' lighting (on the dashboard)	10
	H8	Position light from the left	7,5
FB2	A1	Sound and warning signal	7,5
	B2	Lighter seat, braking light „STOP", 3-pin socket	15
	C3	Cab lighting, warning flash-light, radio	15
	D4	Hazard lights, communal joint	15
	E5	Working headlights	10
	F6	Air-conditioning system (option)	15
	G7	Working backlights, front field lights	20
	H8	unused	

Tractor lighting

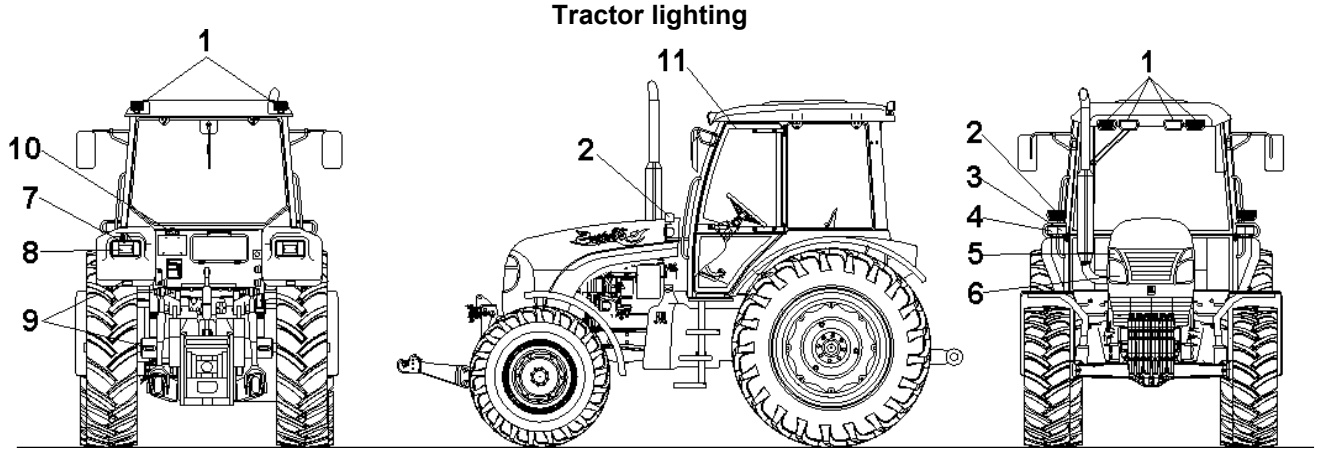


Fig. E-29 Tractor lighting.
1 – operating lights; **2** – additional passing lights (ZEFIR 85K only); **3** – position lights; **4** – side turn signal; **5** – front turn signal; **6** – passing lights; **7** – position lights (rear) and stop lights; **8** – rear turn signal; **9** – reflective light; **10** – number plate lighting; **11** – lights inside the operator cab.

Bulbs listing used in tractors ZEFIR

Item in Fig. E-29	Lamp type (Fig. E-29)	Bulb type	Quantity per tractor
1	Operating lamp: 4 front and 2 rear (mounted on the cab's roof)	H3 (12V, 55W)	6
2	Lamp of additional passing lights (mounted on the bracket of turn signals - ZEFIR 85K)	H4 (12V, 55/60W)	2
3	Front combined lamp – position lights	R10W	2
4	Front combined lamp – side turn signal	P21W	2
5	Main headlight – turn signal light	P21W	2
6	Main headlight – passing lights	H7 (12V, 55W)	2
7	Rear combined lamp - stop lights and position lights	P21/5W	2
8	Rear combined lamp – turn signal light	P21W	2
9	Reflective lights	-	4
10	Number plate lighting	R10W	1
11	Lights inside the operator cab	C5W	2

BONNET AND SIDE COVERS OF THE ENGINE

Bonnet is hinged next to the front window of the operator cab in order to gain easy access to the engine for carrying out regular servicing procedures. Two gaz springs are located under the bonnet and faciliate hoisting it up.

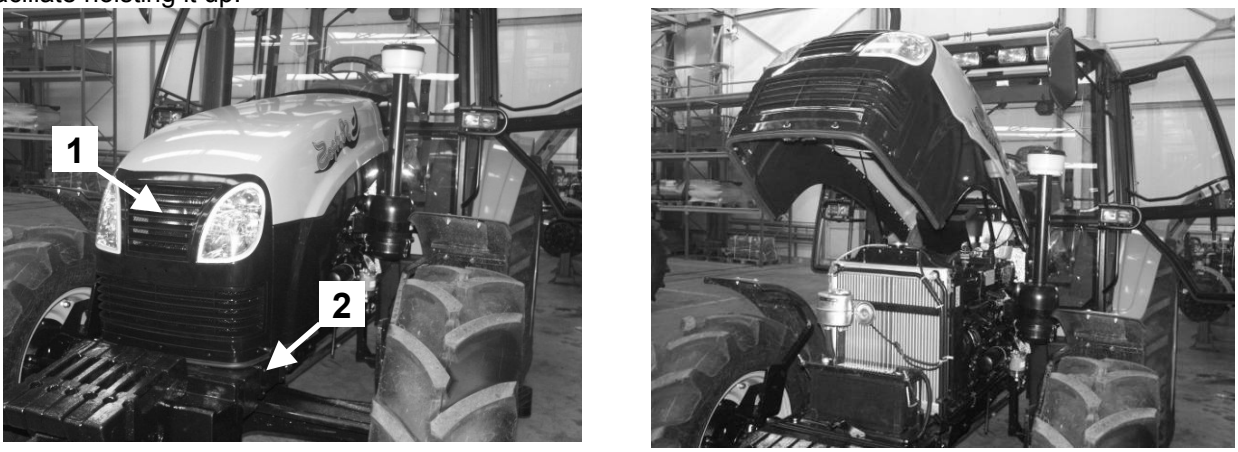


Fig. E-30 Engine bonnet. **1** – engine bonnet; **2** – pull rod of the bonnet lock

In order to hoist the engine bonnet up **1** (**Fig. E-30**) one must:

- pull the pull rod **2** and open the bonnet lock;
- lift the bonnet **1** up so to make it hold up thanks to gas springs;

when closing the engine bonnet you must let it down by vigorous move. The bonnet lock should lock oneself in.

WASHING THE TRACTOR

Tractors **ZEFIR** are modern machines with large amount of electric-type, water-sensitive sub-assemblies. You must keep this in mind when setting about washing it up, especially when using high-pressure washing device.

The tractor can be washed with water plus generally available car washing agents. Before setting about washing you must secure the battery, starter, a.c. generator, exhaust pipe and air filter inlet, against water. When washing the tractor remove the dirt from the surface of tractor assemblies.

When using high-pressure washing device you must not stand close to the tractor and you must avoid directing the water jet towards electronic or electric-type sub-assemblies, electrical joints and vent openings.

ATTENTION: Never direct the cold water jet towards hot engine or exhaust system.

GRINDING IN THE TRACTOR

First 50 mth of the tractor operation significantly affects the tractor lifetime and especially its engine.

New tractor, at the beginning of its operation ought to be grinded in for at least 50 mth.
When gringing in, you should:

- not to allow the engine get overheated;
- not to allow the engine get overloaded. Working at high at high load could cause engine overload. It manifests with no reaction when rising revolutions.
- not to allow the engine work without load. It could have the same negative influence on the engine as overloading. Change the kind of performed operation so that the engine is operated both under high as well as low load.
- mindfully observe readings of the measuring-control devices;
- stop the engine and ask for a service in case of any signs of irregular operation of the engine or the tractor.

During grinding in period, apart from regular servicing actions, you must inspect the operating liquids level and oil level in the gear-box and rear driving axle, hydraulic system, front driving axle and engine, every 10 mth. It is necessary to inspect screws tightness, that fix wheels to wheel hubs.

SERVICING AFTER GRINDING IN PERIOD **P-1 (50 MTH)**

After grinding in perion it is necessary to carry out technical review P-1 after 50 mth (it should be done in authorised technical services approved by the manufacturer) within the range recommended in the warranty card (review after grinding in period). Costs of the review is born by the purchaser.

The review after grinding in period ought to include such actions as:

- wash the tractor and inspect the engine operation, steering system, brake system, clutch system, electric wiring and all other systems and assmeblies of the tractor;
- change the oil and filter in the engine;
- change the oil in oil sump of the air filter (vesrion with wet air filter), inspect tightness of connection of the air filter and condition of filtering elements;
- change oil in wheel reduction gears and main gear of the front axle;
- change oil and oil filter in hydraulic system, gear-box, rear axle;
- change oil in steering system;
- change cooling agent and flush out the cooling system of the engine;
- inspect the condition and tension of V-belts of drive unit of the fan, a.c. generator and compressor;
- remove deposits from preliminary sedimentation tank of the fuel oil and fuel tank;
- remove condensation water from the tank of the pneumatic system;
- inspect and, if need be, adjust parking brake;
- check fluid level in the hydraulic system for steering with brakes;
- check technical condition of tyres and tyre pressure;
- check (adjust) front wheels toe-in;
- inspect and tighten screw joints of the tractor assemblies;
- inspect tightness of screws, that fix wheel bands to wheel disks and wheel disks to wheel hubs, it refers to both front and rear wheels;
- inspect and tighten engine head;
- adjust valve clearance of the engine;
- check tightness of screws, that fix front weights;
- lubricate all lubrication points;
- inspect the battery, clean up its terminals;
- remove all fuel and oil leakages;

The manner for taking aforementioned actions was described in Chapter **„F. TECHNICAL MAINTENANCE OF THE TRACTOR”**.

F. TECHNICAL MAINTENANCE OF THE TRACTOR

TECHNICAL REVIEWS TABLE

No. of action	Servicing activities	Technical review after each (mth):			
		PC	P-2	P-3	P-4
		(10*)	(200)	(400)	(800)
Technical review (TR) after each 10 mth (or every day)					
1	Check oil level in the engine	X	X	X	X
1a	Inspect the degree of contamination and oil level in oil sump of the air filter (engine version with wet air filter) or degree of contamination of dry filtration elements of the air filter (engine version with dry oil filter)	X	X	X	X
2	Inspect oil level in the tank of the steering system	X	X	X	X
3	Check cooling agent level in the cooler	X	X	X	X
4	Check hydraulic oil level in the tank of hydraulic system for steering with brakes	X	X	X	X
5	Inspect liquid level in the tank of front windscreen washer	X	X	X	X
6	Check fuel level in fule tank	X	X	X	X
7	Check and remove deposits (impurities) from the preliminary sedimentation tank of the fuel filter and fuel tank	X	X	X	X
8	Check technical condition of tyres and tyre pressure.	X	X	X	X
9	Remove condensation water from the tank of the pneumatic system	X	X	X	X
10	Inspect tightness of all external screw joints, especially of wheel hubs of both front and rear tractor wheels.	X	X	X	X
11	Lubricate the water pump shaft and wheel hubs of rear wheels of the tractor	X	X	X	X
12	Remove all leakages and lack of tightness in fuel system, hydraulic system, cooling system and engine air inlet system.	X	X	X	X
13	Inspect the engine, steering system, braking system and all other system and assemblies of the tractor	X	X	X	X
14	Replace filtering cut-off wall in hydraulic oil filter	Replace every 8 mth for first 64 mth of operation.			
15	Check the tension of driving belt of the fan	Every 50mth			
16	Lubricate front axle revolution pin, joints of the servomotor of steering system, elements of rear three-point hang-up system, joint of driving shaft of the front axle	Every 50mth			
Technical review (P-2) after each 200 mth					
17	Change oil and oil filter in the engine		X	X	X
18	Replace filtering element of the rough and fine fuel filter and deaerate fule system		X	X	X
19	Replace filtering element together with oil filter cut-off wall of the hydraulic system		X	X	X
20	Change oil in oil sump of the air filter and clean its filtering elements (engine version with wet air filter)		X	X	X
21	Clean air filter in the compressor		X	X	X
22	Check tightness of the engine head		X	X	X
23	Inspect and adjust valve clearance		X	X	X
Technical review (P-3) after each 400 mth					
24	Check oil level in hydraulic system, gear-box and rear axle			X	X
25	Check oil level in main gear and wheel reduction gears of the front driving axle			X	X
26	Verify parking brake performance (dead movement of the lever)			X	X
27	Lubricate bearings of stub-axle of wheel reduction gears of the front axle			X	X

F. TECHNICAL MAINTENANCE OF THE TRACTOR

No. of action	Servicing activities	Technical review after each (mth):			
		PC	P-2	P-3	P-4
		(10*)	(200)	(400)	(800)
28	Verify the condition of batteries (electrolyte content – service battery)			X	X
29	Check air filter in the cab			X	X
Technical review (P-4) after each 800 mth					
30	Change oil in hydraulic system, gear-box and rear axle				X
31	Change oil in main gear and wheel reduction gears of the front axle				X
32	Change oil in steering system				X
33	Check fuel injectors and injection pump of the fuel system				X
34	Check the condition of a.c. generator and starter				X
35	Check the condition of water pump				X
General maintenance (if need be)					
36	Changing bulbs				
37	Inspecting toe-in of front wheels				

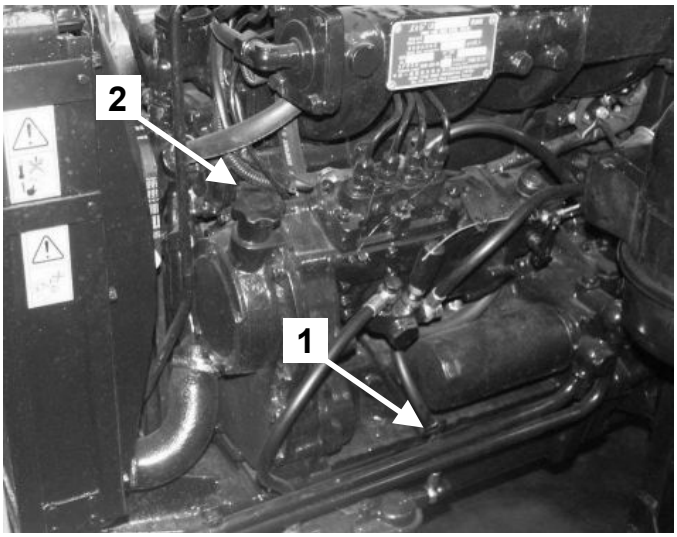
ATTENTION ! Specified maintenence periods, expressed in motohours (mth), must not be exceeded 10 mth term.

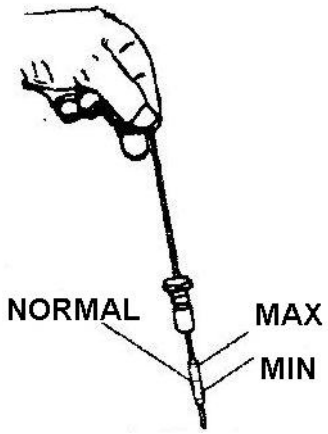
ATTENTION ! Before setting about performing each technical review, you must wash the tractor.

TECHNICAL REVIEW (PC) AFTER 10 MTH OF OPERATION OR EVERY DAY

OPERATION No. 1. Oil level in the engine

Oil level in the engine must be checked before setting about work or after 15 minutes from the moment of stopping of warmed engine. For this purpose, you must take the dip rod out **1**, wipe it up and put in again. Then take it out once again and check the oil level. It should range between **„min"** and **„max"** marked on the dip rod **1**. In case the oil lever does not reach the „**min",** you must fill it up. Take the plug of oil file **2** off, pour the oil and verify whether its level is set between aforementioned marks on the dip rod.

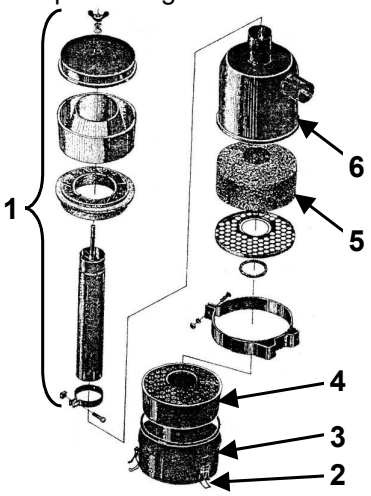




ATTENTION ! It is unacceptable for the engine to work at oil level below bottom mark on the dip rod.

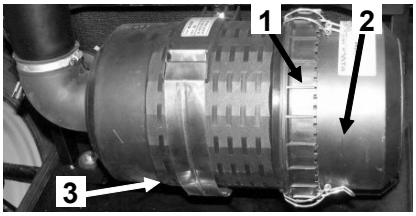
OPERATION No. 1a. Contamination degree and oil level in oil sump of the air filter (engine version with wet air filter) or contamination degree of dry filtration elements of the air filter (engine version with dry air filter).

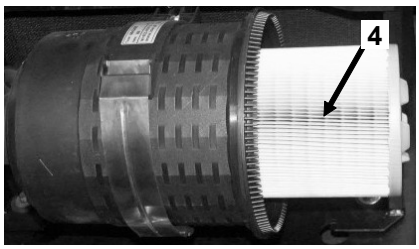
In order to check oil level in oil sump of the air filter (**engine version with wet air filter**), you must unlatch **2** and take the oil sump of the air filter **3** off. Oil level in oil sump of the air filter should range to the mark inside the oil sump. If need be, fill it up with engine oil. You must not pour oil more than up to the mark.

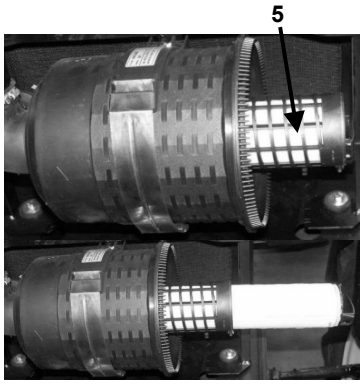


In case of heavy contamination of the filter, clean the surface of the filter body from the inside and flush out filtration element **4, 5** with cleaning agent. Then, change oil.

You must inspect the air filter (**engine version with dry air filter**) avery day or when a signal lamp indicating contamination of air filter, lights up ot the control panel (**Fig. D-3**).





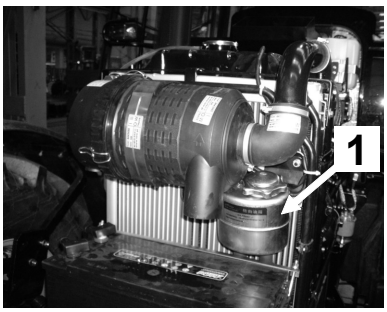


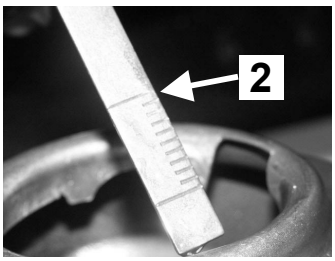
Dry air filter of the engine is mounted in front of the engine.
It consists of external **4** and internal **5** filtration element. In order to check air filter you must take aftermentioned actions:
- unlatch **1** and take the air filter cover **2** off;
- take the external filtering element **4** out of the body
- check the degree of contamination of the surface of internal filtering element **5,** without taking it out.

ATTENTION! It is not recommended to take the filtering element **5** out of the filter body. Contamination of the internal filtering element **5** speaks for damage of the coat of external filtering element (ripping, comming unstuck); in such case you must flush out or replace internal filtering element **5** and replace external filtering element **4.**

After having wet and dry air filter cleaned, you must verify the tightness of air filter connections.
For this purpose, when engine is running (at medium speed, ie. approx. 1000 rpm), you must cover the filter inlet **3** up. If all connections are tight, the engine will stop. If it does not stop, you must tighten all fixing elements of the filter, so to obtain aforementioned effect at the second attempt.

OPERATION No. 2. Oil level in the tank of the steering system





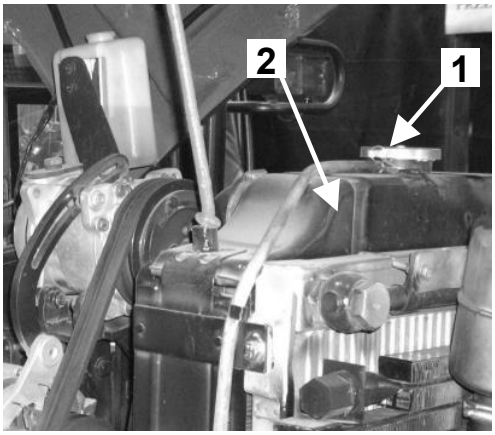
Tank of the steering system **1** is located in the front of the engine, in front of the radiator.
Oil level in the tank of the steering system must range to the upper line on the dip rod **2** attached to the tank cap. If not, you must fill the oil until you get desired level.

ATTENTION ! It is forbiden to start the engine if oil level in the tank is below required.

OPERATION No. 3. Coolant level in cooling system of the engine

Cooling system of the engine operates under pressure. Opening cap when the engine is hot is dangerous.

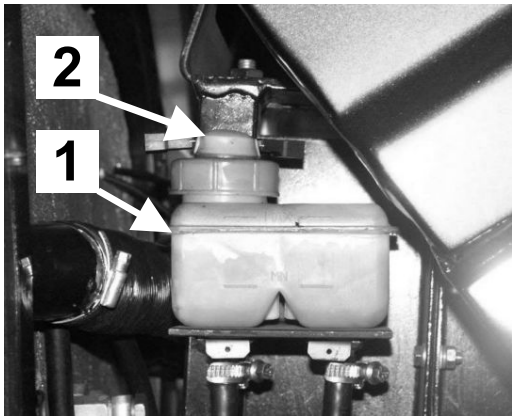
Cap of radiator inlet must be opened only with the engine cold and after having the equalizing tank opened first. Non observance of this rule may produce getting burned threat !



Lift the bonnet and check the coolant level in the cooler **2** with the engine cold.
To do so, you must open the cap **1** of the cooler inlet and check the coolant level, which should range within 10 cm from the upper part of the cooler inlet. If need be, pour the coolant up to required level, close the cooler inlet cap **2**. Verify the tightness of the cooling system.

ATTENTION ! It is recommended to change the coolant at least once a two years or after each 800 mth.

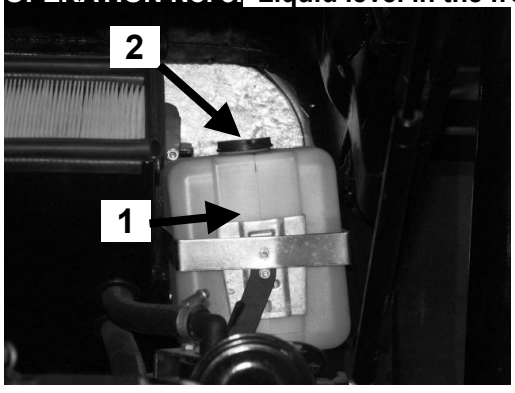
OPERATION No. 4. Hydraulic oil level in the tank of the hydraulic system for brakes control.



Inspect visually liquid level in the tank **1** of the brakes control system. Oil level should range between “min” and “max” lines marked on the tank. If need be, fill the oil up to required level, taking the cap **2** first.
You must use SAE 10W hydraulic oil
The fluid level is checked by the sensor placed on the tank cap.

ATTENTION ! It is recommended to change brake fluid at least once a two years or after each 800 mth.

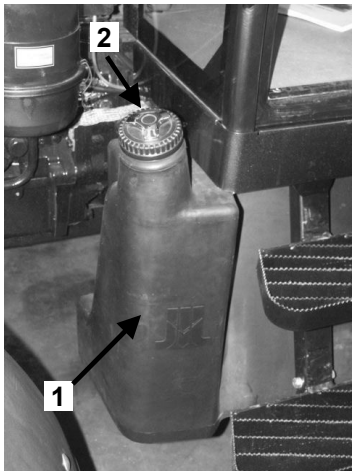
OPERATION No. 5. Liquid level in the front windscreen washer tank



Tank **1** of the front windscreen washer is located under the bonnet next to the operator’s cab. In case of fluid shortage, you must fill it up by taking the cap **2** off and pouring the liquid into the tank. In low temperatures you must use non-freezing washing liquid.

OPERATION No. 6. Fuel level in the fuel tank

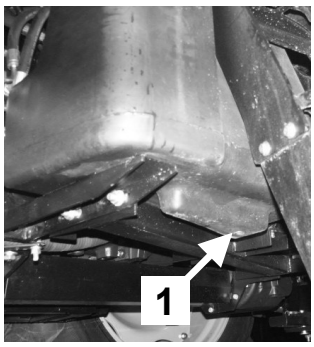
Tractors **ZEFIR** are equipped with one fuel tank of capacity of 155 l, located on the left hand of the tractor. In case the "reserve" signal lamp lights up, you must fill the tank up with fuel.

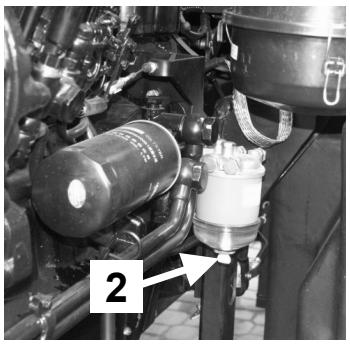


In order to make the fuel tak full, you ought to:
- clean the surface around fuel inlet cap **2**, so not to allow any dirt to get into the tank and contaminate the fuel
- take the inlet cap off and place it onto clean surface when fueling
- after filling the tank, put on and tighten the cap.

ATTENTION:
1. Lost or damaged cap must always be replaced with original spare cap.
2. Never take the cap off, nor pour fuel when the engine is running.
3. Control inlet nozzle when fueling.
4. Never top up. Leave some space to allow the fuel to expand.
5. Wipe up spilled fuel immediately.
6. Never smoke close upon diesel oil.

OPERATION No. 7. Deposits in sedimentation tank of the preliminary fuel filter and fuel tank





In order to remove deposits (impurities), you must turn on:
- drain plug **1** of the fuel tank
- drain plug **2** of the preliminary fuel filter;

and drain impurities to previously prepared bathtub, utlil clean fuel starts to flow out. After taking aforementioned action, tight the plugs **1** and **2**.
ATTENTION! Plug **1** of the fuel tank must be turned by applying force of **10 Nm**.

OPERATION No. 8. Technical condition of tyres and tyre pressure

Inspect the condition of the tyre thread and check tyre pressure. See if there are no damages of the tyre thread and tyre side walls. Adjust tyre pressure depending on the kind of performed operation and load.

Pressure in front and rear tyres ought to range to **0,1...0,16 MPa** depending on the kind of performed operation and load. At maximum load, the tyre pressure ought to amount to 0,16 MPa.

Admissible tyre carrying capacity at speed of 40 km/h; 30 km/h and 10 km/h:

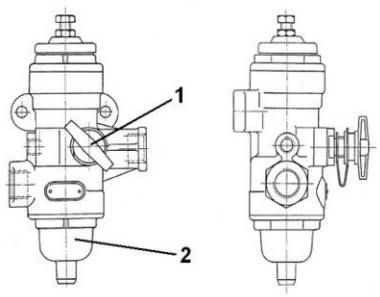
	Tyre (dimensionsy)	**Carrying capacity [kg] / pressure [kPa] at speed:**		
		40 km/h	30 km/h	10 km/h
Front axle	11.2R28 TT	1250 /160	1340 /160	1650 /160
	14.9R24 TT	1700/160	1820/160	2245/160
	380/70R24 TL	1650/160	1765/160	2180/160
	13.6R24 TT	1450 /160	1550 /160	1915 /160
	380/85R24 TL	1950 /160	2090 /160	2500 /160
Rear axle	16.9R34 TT	2430 /160	2600 /160	3210 /160
	18.4R34 TT	2800/160	2995/160	3695/160
	18.4-34 TL		2650 /140	
	11.2R42	2430 /160		2980 /160
	16.9R38 TT	2575 /160	2755 /160	3400/160
	420/85R34 TL	2650/160	2840/160	3400/160
	520/70R34 TL	3150/160	3370/160	4160/160

When working with the front loader, front tyre pressure ought to be maximum.

1. Do not exceed recommended pressure values, because it may cause tyre damage (blow-up), which is dangerous for the operator, tractor and surroundings.
2. You must not take any repair action in relation to tyre unless the wheel rim is taken off as well as in relation to rim, especially welding with tyre (tube) put on.

For inflating tyres you may use pneumatic system (for braking trailers) of the tractor. For this purpose use air pressure control device located next to the air tank from the right side of the tractor.
In order to inflate tyres, you must take following actions:

- remove the air from the system by pressing drain valve of the air tank;
- take securing nut **1** off the stub pipe of the pressure control device;
- connect inflating hose with the stub pipe and tyre-valve of inflated tyre;
- switch on the compressor (in case it is switched off);
- inflate the tyre with required pressure;
- switch the compressor off, detach the inflating hose and tighten securing nut **1**.



Pressure control device is equipped with filter for purifying air from mechanical impurities.

Depending on working conditions of the tractor and control device, it is recommended to dismantle bottom cover 2 averagely 2-4 times a year and flush out the filter.

The filter can be flushed out with gasoline or dissolving agent and blow through with compressed air. Dried-out filter can be mounted back to the control device. Apart from aforementioned the control device does not require special service on-the-job.

ATTENTION! Repair action in relation to air pressure control device may be taken only by authorized service for products of VISTEON Poland SA, according to Repair Manual.

OPERATION No. 9. Condensation water in the pneumatic system.

The tank of the pneumatic system is located from the right of the cab below the battery switch.
In order to remove condensation water from the tank of pneumatic system, you must pull home parking brake of the tractor, block wheels and shut off the engine. Then, you must move the drain valve **1** aside in any direction and let the pressurized air out, along with condensation water. After starting the engine, the tank will be filled back with air.

OPERATION No. 10. Tightening external screw joints including hubs of front and rear wheels

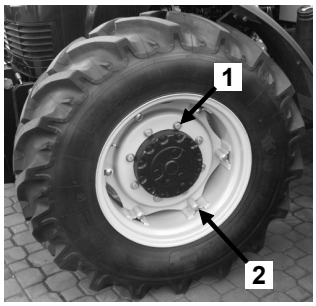
Using purpose-made wrenches, you must verify tightness (correctness) of external screw joints of the tractor assemblies. Among others, you must inspect:

- nuts fixing front and rear wheels and rear wheel hubs screws;
- screws fixing weights of the front axle and rear wheels of the tractor;
- front axle bracket and frame;
- frame and clutch body;
- engine body and clutch casing;
- clutch casing and gear-box body;
- gear-box body and rear axle casing;
- rear axle casing and upper bracket of three-point hang-up system;
- front and rear cab brackets;
- brackets and pins of steering system servomotor;
- rear axle protecting tube along with its body;
- body and front driving axle reduction gear;

- bolts (wedges) of the front driving axle;
- tightness of all screws fixing collars of two shafts of the front driving axle;
- tightness of screws of connection of engine and driving system, with front bracket and front bracket with front axle.

In case of necessity of replacement of screws fixing collars of driving axles, you must replace them only with screws provided by authorised points of sale or points of service.

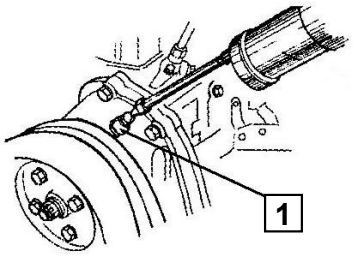
Any clearance within screwed joints (external) of the tractor assemblies is unacceptable.

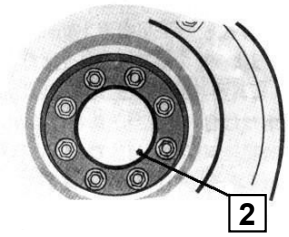


With use of torque spanner check whether screws of wheel disk **1** are screwed tight with hubs of both rear and front wheels of the tractor.
Screws ought to be tighten wit use of force:
- front wheels: 280 Nm
- rear wheels: 280 Nm

Check and if need be tighten screws fixing front and rear wheel disks to wheel bands **2** by applying force of 230±20 Nm

OPERATION No. 11. Lubricate bearing of the water pump shaft and hubs of rear wheels of the tractor





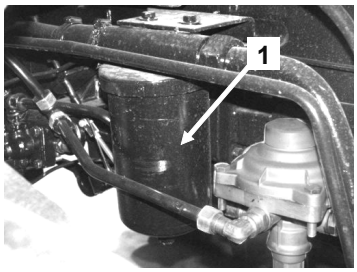
Lubricate the bearing of the water pump shaft **1** and hubs of rear wheels **2** of the tractor until emersion of grease on lubricating nozzles.

OPERATION No. 12. Remove any leakiness and leakage in fuel, hydraulic, cooling and air influx systems

OPERATION No. 13. Engine, steering system, braking system and all others systems and assemblies of the tractor

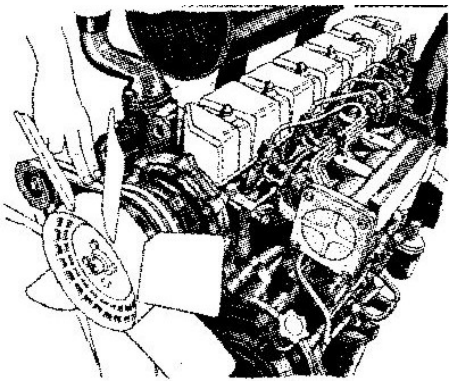
The engine ought to work smoothly within the range of rotational speed. Steering elements, steering system, brakes, lighting and signalling system, windscreen washers ought to be in working order and in good technical condition. Before setting about operating the tractor, you must verify aforementioned elements.

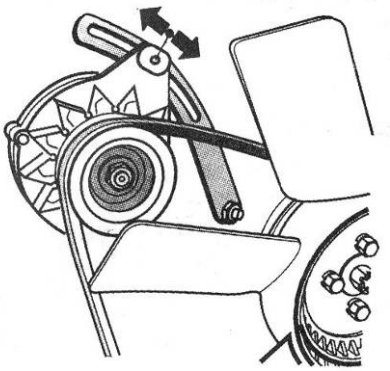
OPERATION No. 14. Filtration cut-off wall inside the hydraulic oil filter (every 8 mth for the first 64 mth).



Replace filtration cut-off vwall located inside the hydraulic oil filter **1.**

OPERATION No. 15. **Tension of V-belt of the air fan and a.c. generator drive (every 50 mth).**





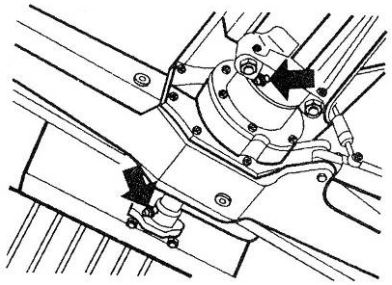
Tension of the V-belt is measured by its deflection in the place shown in the picture (between belt pulley of the a.c. generator and belt pulley of the fan. The deflection ought to range within **10÷20 mm**, when applying force of **30÷50 N** (3÷5 kG).

The V-belt tension may be adjusted by changing setting of the a.c. generator after having fixing screws loosened first. Having adjusting procedure completed, you must tighten fixing screws.

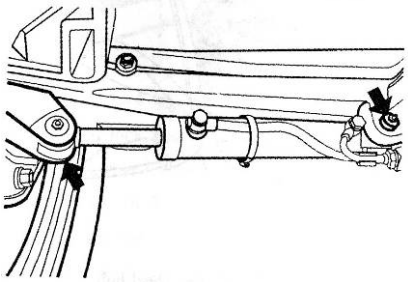
OPERATION No. 16. **Lubrication points (every 50 mth)**

Lubricate all floating joints with use of lubricator. You must pump grease until emersion of lubricant on the lubricator thimble.

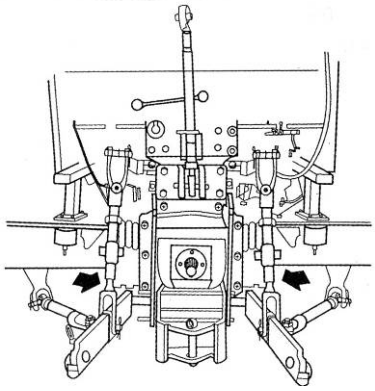
Lubrication points:



- pin of front driving axle and front driving axle joints



- joints of the steering system servomotor



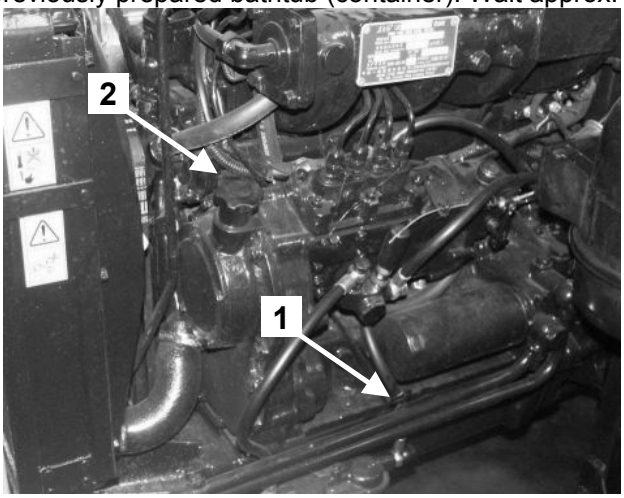
- elements of the rear three-point hang-up system

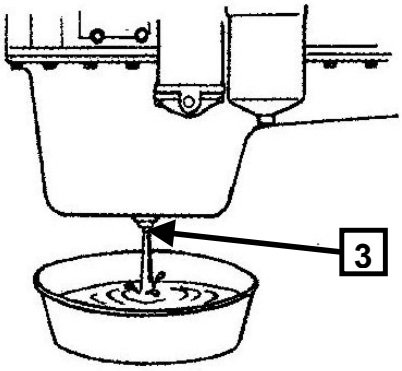
TECHNICAL REVIEW (P-2) AFTER 200 MTH OF OPERATION

Take all actions of technical review after 10 mth plus:

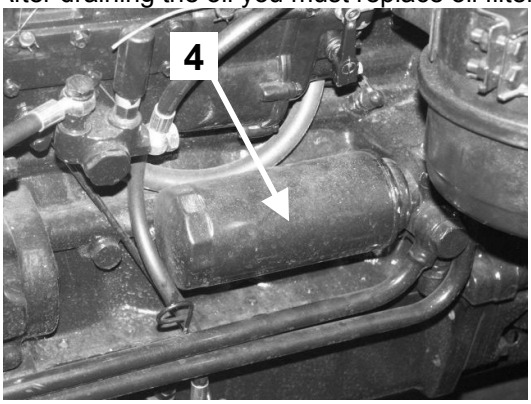
OPERATION No. 17. Oil and oil filter replacement

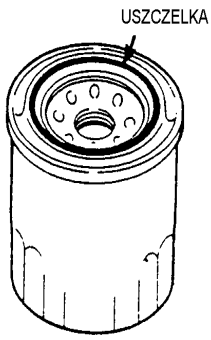
Before setting about oil and oil filter replacement, position the tractor on flat ground and pull the parking brake. Start the engine so to obtain temperature of the coolant amounting to approx. 70°C (it is best to change oil after work). Stop the engine, open the filler plug **2**, and then screw out drain plug **3** and drain oil to previously prepared bathtub (container). Wait approx. 10÷15 min. so that used oil did not stay in the engine.





After draining the oil you must replace oil filter **4**. To do so you must take following action:





- unscrew dirty filter;
- apply few drops of oil onto the sealing ring of the new oil filter;
- screw in the new filter until sealing ring touches filter body and then tight is with hand making half turn (do not tight to strong).

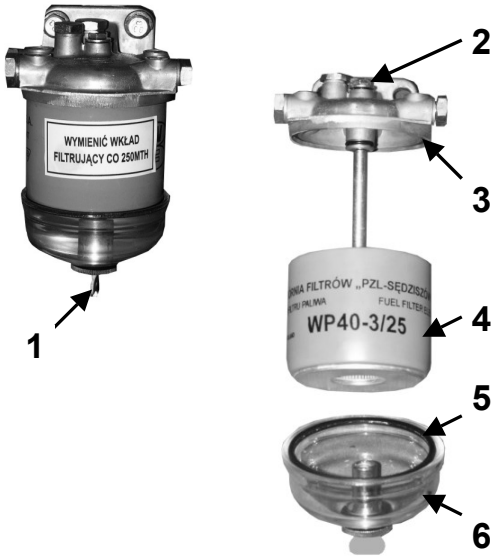
Attention! When uncrewing worn filter you must not use a hammer, engineer's chisel, etc., because such act may damage the filter body or engine block. You may use filters recommended by the engine manufacturers only (original).

Attention! Screw tight the filter by hand and do not use any tools.

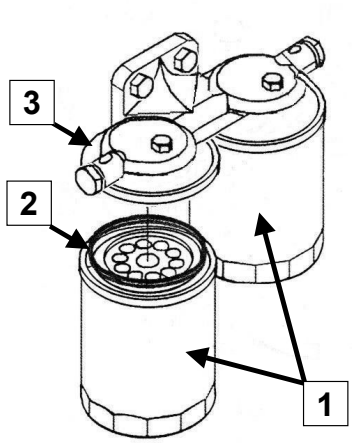
After havinf the filrer replaced you must screw the drain plug **3** in and fill up the engine with fresh oil through oil filler **2** to recommended level. Twist the oil filler **2** and start the engine for couple of minutes. After stopping the engine, wait 10 minutes and check the oil lever with use of dip rod **1** and, if need be fill it up.

OPERATION No. 18 Changing filtering element of the preliminary filter and fuel purifying element

Service life of the filter element mostly depends on degree of purity of the fuel in use. In case there is a suspicion, that the fuel is not clean enough, you must check the filter more often and replace the filter element. Any time you change the fuel, in connection with the autumn-winter period or winter-spring period (however at least each 200 mth), you must change the preliminary filter element and fuel purifying element as well.



In order to replace filtering element of the preliminary fuel filter, one must:
- drain the fuel from the filter by screwing drain plug **1** out the sedimentation tank
- unscrew screw **2** fixing filter element **4** and sedimentation tank **6** to the body **3**
- take the filter element **4** out
- put new filter element in and after having new sealing ring installed **5** mount the sedimentation tank **6**
- screw the bolt **2** tight
- deaerate the fule system.



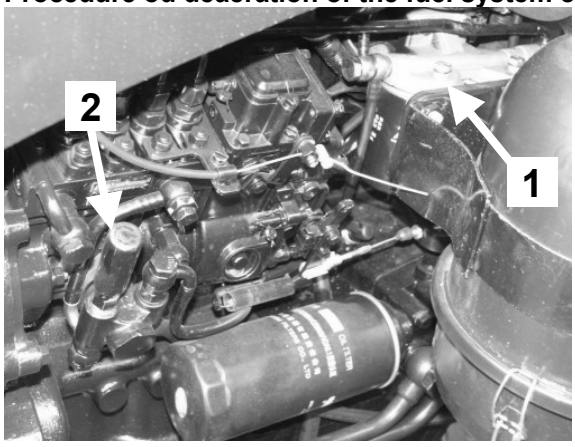
When replacing filters of fine purifying, you must take following steps:
- unscrew two contaminated filters **1** of fine purifying;
- screw new filter in until the sealing ring **2** of the filter touches the filter body **3**, and then make a half turn with hand (you must not tight too strong).
- deaerate the fuel system;

Attention! When uncrewing worn filter you must not use a hammer, engineer's chisel, etc., because such act may damage the filter body or engine block. You may use filters recommended by the engine manufacturers only (original).

Attention! Screw tight the filter by hand and do not use any tools.

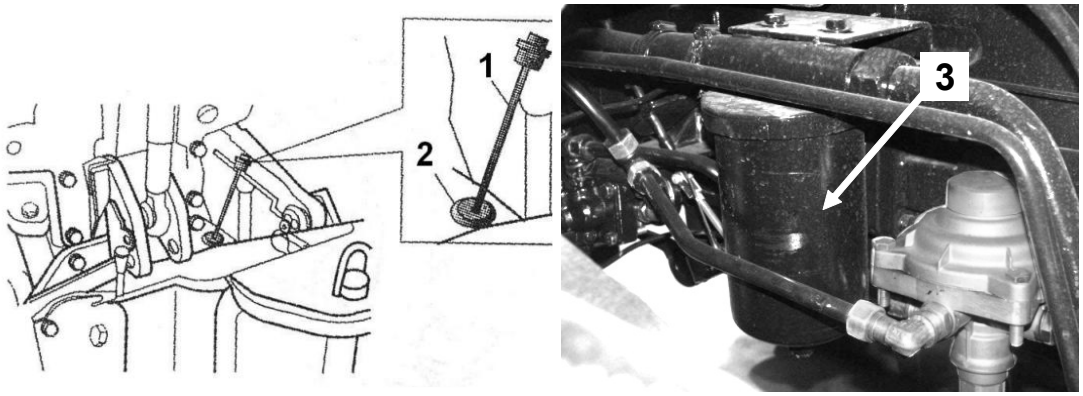
If need be, deaerate the fuel system.

Procedure od deaeration of the fuel system consists in:



For deaerating fuel system you must use hand fuel pump.
For this purpose you must loosen screw **1** located next to filters of fine purifying, and then with use of hand fuel pump **2**, pump the fuel until the fuel starts to flow out from below the loosened screw with stream without air bubbles. Then you must screw the bolt **1** tight.

OPERATION No. 19. **Replacement of filtering element together with cut-off wall of hydraulic system, gear-box and rear axle.**



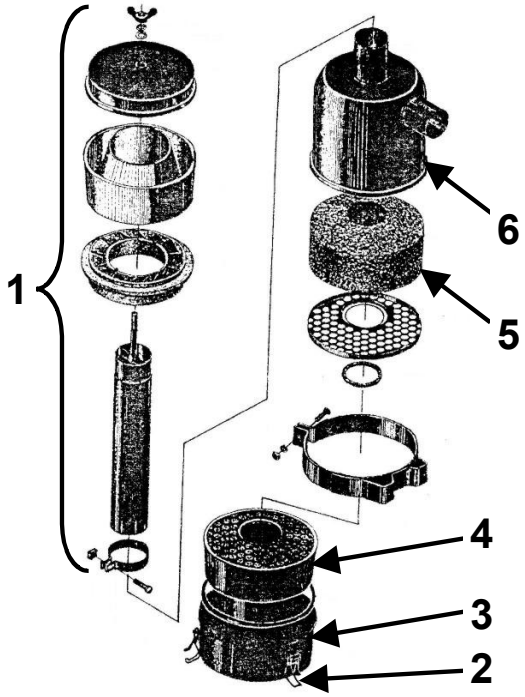
In order to replace the filter in hydraulic system, one must:

- unscrew the oil filter casing **3** (located from the right of the gear-box body);
- take the filter element and cut-off wall out of the casing;
- clean the filter casing from the inside;
- put the new filter element and cut-off wall in;
- refill hydraulic oil to required level marked on the dip rod **1**. Oil level ought to range between lines on the dip rod.

ATTENTION! When working with machines of high capacity hydraulic systems, oil level in the tank of hydraulic system must range to the upper line on the dip rod.

ATTENTION! It is forbiden to start the tractor if oil level in the tank ranges below the bottom line on the dip rod.

OPERATION No. 20. **Replacement of the oil in oil sump of the air filter (engine version with wet air filter).**



Unlatch **2** and take the oil sump **3** of the air filter off. Drain contaminated oil to previously prepared bathtub. Clean filter body from the inside and in case of heavy dirt, flush filter elements **4, 5** out with cleaning

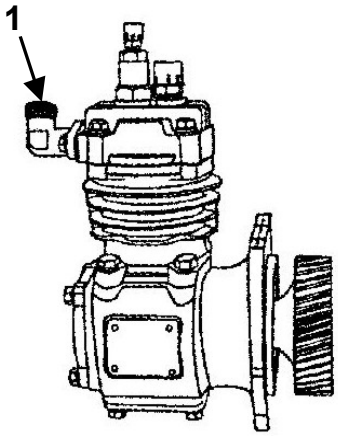
agent. Install filtering elements and pour fresh oil into oil sump. Oil level ought to range to the line marked inside oil sump **3**. The oil level must not exceed the marking inside the oil sump.

ATTENTION ! If the tractor operates under conditions of heavy dustiness, you must check the air filter after each 20 mth.

Having the air filter cleaned you must check tightness of its connections.

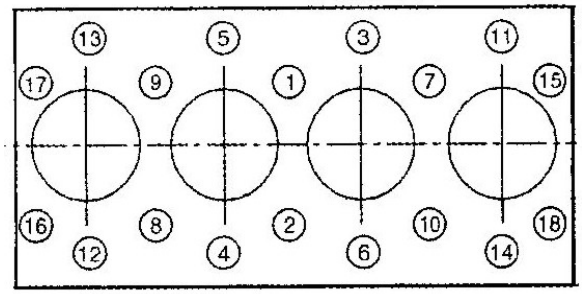
For this purpose, while the engine is running (at medium speed, ie. approx. 1000 rpm), you must cover the filter inlet **3** up. If all connections are tight, the engine will stop. If it does not stop, you must tighten all fixing elements of the filter, so to obtain aforementioned effect at the second attempt.

OPERATION No. 21. Cleaning air filter in the compressor



Unscrew and blow through the air filter **1** in the air compressor with use of compressed air.

OPERATION No. 22. Tighteninh the engine head



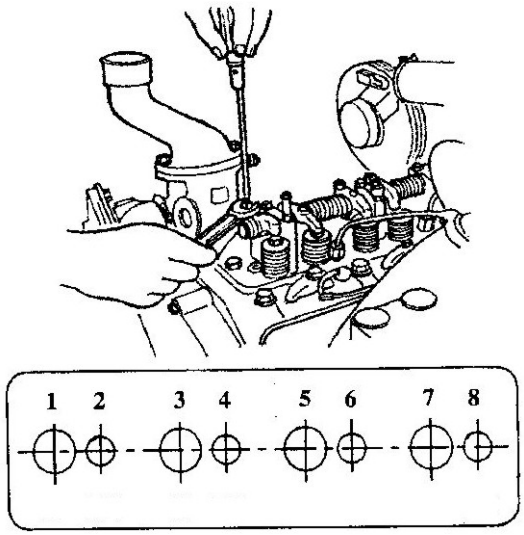
Tightness of screws fixing engine head must be checked while the engine is warm, respectively. First you need to screw the bolts tight by applying force of 80Nm, and then of 181 Nm.

After having the engine head screwed tight, you must check and adjust valve clearance of the engine.

OPERATION No. 23. Valve clearance of the engine

Adjust valve clearance while the engine is cold, checking tightness of the engine head first.

Valve clearance adjustment procedure consists in:



- with use of tubular spanner turn the crankshaft until obtaining valve overlap on the first cylinder [inlet valve (suction valve) opens, outlet valve (exhaust valve) closes], and then adjust clearance of the 1st, 2nd, 3rd and 6th valve starting from the fan;
- valve clearance is measured with use of clearance gauge between valve spindle and valve rocker. In order to adjust valve clearance you must loosen the securing nut of the adjusting screw in the valve rocker. By screwing the adjusting screw in or out, you may set desired valve clearance and verify it with use of clearance gauge.

After adjusting clearance and screwing tight the securing nut 1 you must check the clearance by turning the valve rod;

- make a one turn (360°), with the crankshaft, so that valves of the 4th cylinder got overlapped and adjust the clearance on 4th, 5th, 7th and 8th valve.

Valve clearance is measured while the engine is cold and is should range to:
- 0.3 ÷ 0.4 mm for the inlet valve (suction valve);
- 0.4 ÷ 0.5 mm for the outlet valve (exhaust valve).

After having valve clearance adjusted, you may mount the valve cover and install (if need be) new seal.

ATTENTION ! Valve clearance must be checked and adjusted after each take-down of the head.

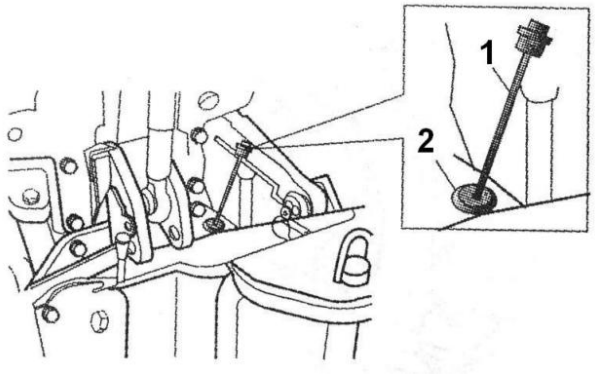
TECHNICAL REVIEW (P-3) AFTER 400 MTH OF OPERATION

Take all actions of aforementioned technical review plus:

OPERATION No. 24. Oil level in the hydraulic system and in gear-box and rear axle

ATTENTION ! Before setting about checking oil level in the hydraulic system and in gear-box and rear axle, you must position the tractor on level ground, stop the engine and pull the parking brake.

Oil level in the hydraulic system and gear-box and rear axle in tractors **ZEFIR** must be checked with use of dip rod **1**, placed in the filler plug on the rear axle body in the rear of the tracotr.



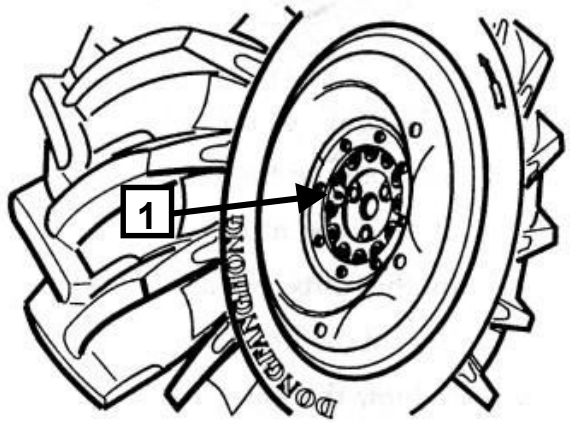
Oil level ought to range between bottom and upper line on the dip rod located in the filler plug.

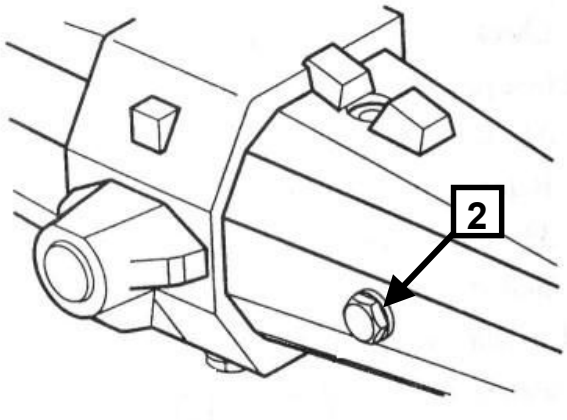
In case of insufficient oil content, you must refill the oil through filler opening **2** up to required level.

ATTENTION! When working with machines of high capacity hydraulic systems, oil level in the tank of hydraulic system must range to the upper line on the dip rod.

ATTENTION! It is forbiden to start the tractor if oil level in the tank ranges below the bottom line on the dip rod.

OPERATION No. 25. Oil level in the body and wheel reduction gear of the front driving axle

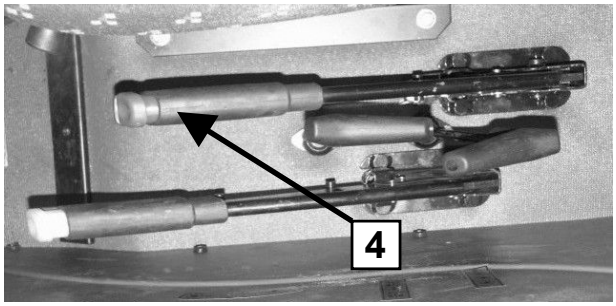


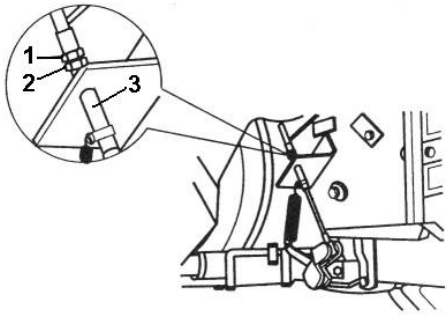


Verification of oil level in the wheel reduction gear of the front axle must be performed after arranging filler-control opening **1** along horizontal axis of the wheel section. Oil level ought to range to bottom edge of the filler-control opening **1**. If need be, refill the oil through filler-control opening **1**.

Oil level in the main gear of the front driving axle ought to range to bottom edge of the filler-control opening **2**. If need be, refill the oil through filler-control opening **2**.

OPERATION No. 26. **Checking and adjusting parking brake**





Parking brake (hand brake) **4** must be able to bear the tractor weight on the slope of 18% inclination ratio. In case the brake cannot hold the tractor in-place, you must take adjusting action. To do so, you should unscrew securing nut **1** located on the brake cable 3. Then adjust the cable length **3** with use of nut **2** so to immobilize the tractor on the slope of 18% inclination ratio for approx. 3 teeth of the locking pawl. Screw the securing nut tight on the cable **3**. Pull the lever **4** and meke sure the system works properly.

Tightness of the braking pneumatic system of trailers

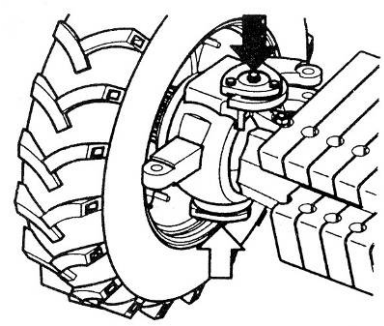
Tightness of pneumatic system of the tractor may be verifyied in the following way:

- after switching off the compressor and starting the engine, brind the pressure down to the value 0.60÷0.65 MPa (6.0÷6.5 kG/cm^2) on manometer located on the dashboard of the tractor;
- position elements of trailer brakes controll unit loosely and stop the engine;
- wait 10 min, from the moment of stopping the engine the pressure drop on the manometer should not be bigger than 2%, which is approx. 0,012÷0,013 MPa (0,12÷0,13 kG/cm^2).

When inspecting tightness, the pneumatic system of the tractor must not be connected with the trailer system (must not be loaded).

In case the pressure drop is higher than required, you must find the problem and resolve it.

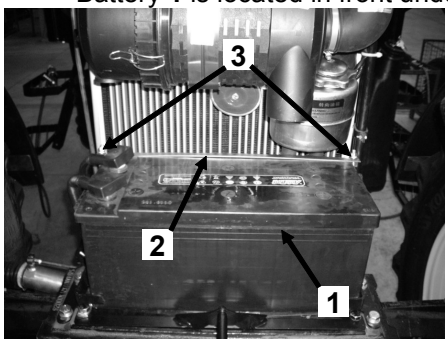
OPERATION No. 27. **Lubricate bearings of steering spindle of the wheel reduction gear of the front driving axle**



Lubricate bearings of upper and lower steering spindle of the right and left wheel reduction gear of the front driving axle (four lubrication points). Lubricate with use of lubricator until emersion of the grease on the lubricating nozzles.

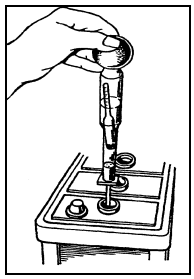
OPERATION No. 28. **Battery**

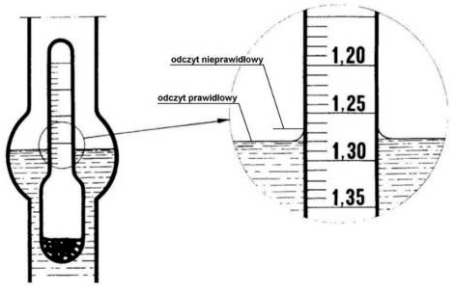
Battery **1** is located in front under the bonnet. To access the battery you must lift the bonnet up.



In case of service battery you must screw out plugs of filler openings and verify electrolyte level. It should range to 12÷15 mm above the accumulator plates. If need be refill with distillated water up to required level.

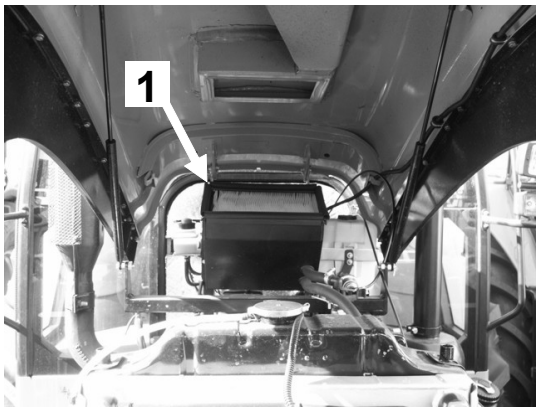
Inspect the condition of clamps and patency of air-holes in plugs and if need be make them clean. Having clamps cleaned and clipped secure them with technical vaseline.

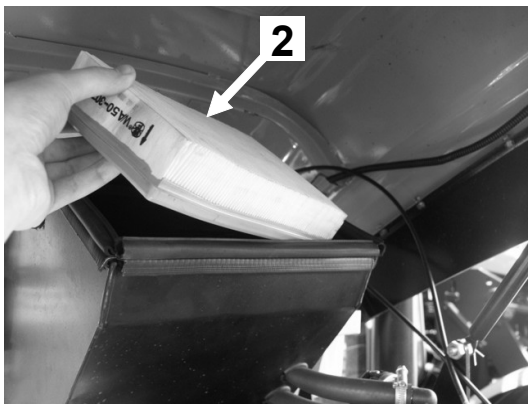




Condition of the battery may me checked basing upon electrolyte density. You may assume, that fully charged (100%) battery corresponds with density of 1.28 g/cm^3. Discharged battery of more that 50% (1.20 g/cm^3) in summer, and 25% (1.24 g/cm^3) in winter, is unacceptable. The battery must be recharged with use of rectifier in order to obtain recommended density of the electrolyte. You must take the battery out when setting about recharging. To do so, you must unscrew two clamp nuts **3** and dismantle the bracket **2** fixing the battery **1**.

OPERATION No. 29. Cleaning air filter of the cab





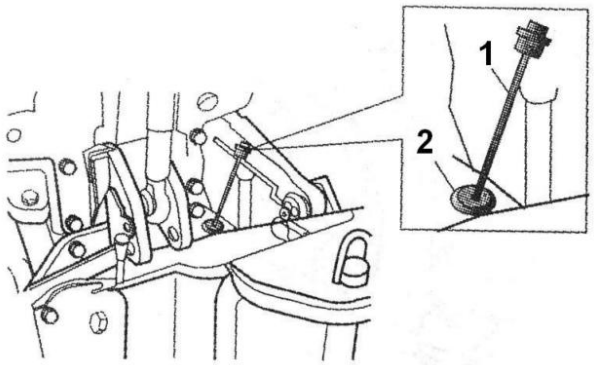
Air filter **1** of the cab is located under the bonnet at the rear. In order to dismantle the filter element **2** you must lift the bonnet and take the filter element out of its casing. Cleaning procedure consists in shaking the dust out and blowin it through with compressed air.
In case of heavy dirt, you must rinse the filter with water plus detergents and dry it out. Mount the filter into its casing by taking aforementioned steps in reversed order.

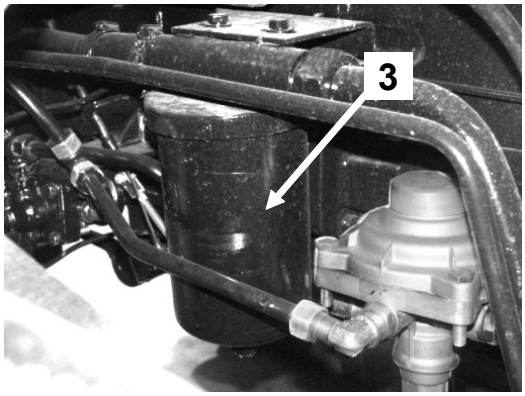
TECHNICAL REVIEW **(P-4) AFTER 800 MTH OF OPERATION**

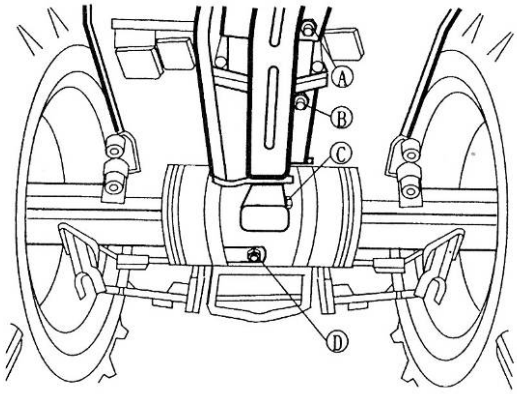
Take all actions of aforementioned technical review plus

OPERATION No. 30. Changing oil and oil filter of the hydraulic system, gear-box and rear axle

ATTENTION ! Before setting about changing oil, you must position the tractor on level ground. It is best to take this action right after work, after stopping the engine. All piston rods of the servomotor of hydraulic system (rear three-point hang-up system) must be drawn out.







In order to chenge oil and oil filter in hydraulic system and driving system, one must:

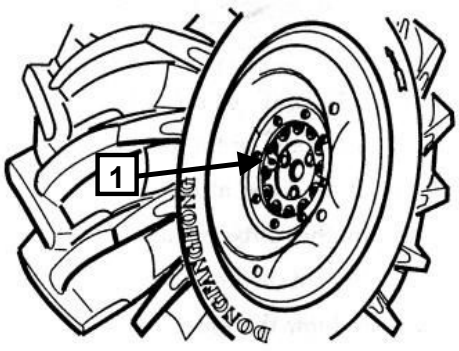
- unscrew filler plug along with oil gauger **1**
- turn the drain plug out **A, B, C, D**
- drain oil from the driving system into previously prepared bathtub
- replace the hydraulic oil filter element **3** (it is located from the right of the bear-box body)
- pour fresh oil into the tank through filler opening **2** up to required level marked on the dip rod **1**. Oil level ought to range between lines on the dip rod.

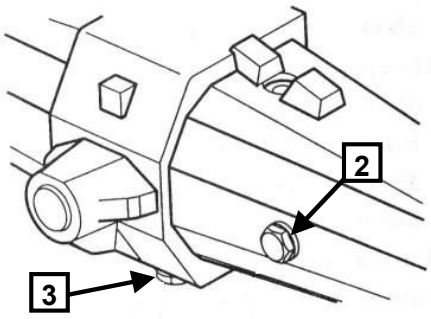
ATTENTION! When working with machines of high capacity hydraulic systems, oil level in the tank of hydraulic system must range to the upper line on the dip rod.

ATTENTION! It is forbiden to start the tractor if oil level in the tank ranges below the bottom line on the dip rod.

OPERATION No. 31. Changing oil in the main gear and wheel reduction gear of the front driving axle

Change the oil after work and after stopping the engine. You must position the tractor on level ground and pill the parking brake.



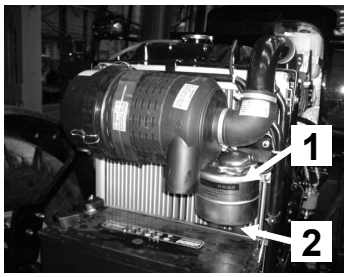


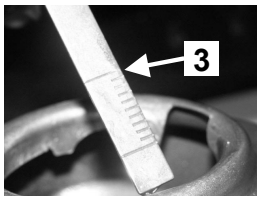
In order to change oil, you must:

- position the wheel so that the control-drain-filler plug of the wheel reduction gear **1** be placed in the lowest point. Unscrew the plug and drain the oil into previously prepared bathtub.
- repeat oil draining procedure for the orter wheel reduction gear.
- unscrew the drain plug of the front axle body **3**
- pour the oil into previously prepared bathtub
- screw the draing plug **3** tight
- turn wheels so that the control-filler plug of the wheel reduction gear **1** be placed in horizontal section axis of the wheel.
- pour fresh oil uo to the bottom edge of filler-control openings of the wheel reduction gear **1** and the body **2**;
- screw all filler-control plugs tight.

OPERATION No. 32. Changing oil in steering system

Procedure of the oil chcnging in the tank of steering system takes place right after stopping the engine. To do so, you must:





- unscrew the filler plug **1** located on the tank of steering system
- loosen the band and take the oil pipe **2** off the connector pipe;
- drain worn oil into previously prepared bathtube;
- put the pipe on the connector pipe and toght the clamping band;
- fill the tank up with oil up to required level.

Oil level in the tank of steering system should range to the upper lone on the dip rod **3** attached to the tank plug.

ATTENTION ! It is forbiden to start the tractor when the oil level is below required.

OPERATION No. 33. Injectors and injection pump of the fuel system

Verification of the operation of injectors and injection pump of the fuel system, must be done by authorised service (service center) of the manufacturer.

In case of irregularities of injector or injection pump operation, you must dismantle these elements and deliver them to authorised service center for the purpose of verification of amount and eveness of pumped fuel by particular sections of the pump.

OPERATION No. 34. Condition of a.c. generator and starter

Loosen screws fixing the a.c. generator and then by twisting the a.c. generator towards the engine block, take the V-belt off the belt pulley of the a.c. generator.

Inspect the impeller (bearing slackness, way of rotation of the impeller) and condition of electric couplings of the a.c. generator.

In case of excessive bearing slackness, you must turn to specialised repair station.

Perform technical review of the starter (condition of brush-holders, impeller collector). In case of excessive wear of the impeller collector, dismantle the starter and deliver it to specialised repair station.

OPERATION No. 35. Condition of water pump

Check the condition of water pump. Remove all water leakages by replacing sealing. Lubricate the bearing of the water pump.

OBSŁUGA OGÓLNA

OPERATION No. 36. Changing bulbs

When changing bulbs you must disconnect the battery with use of a switch located next to the battery.
Do not touch the halogen bulbs with bare hands.

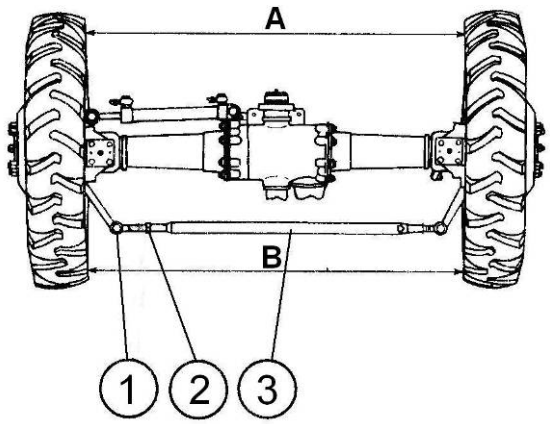
Sequence of operations while changing bulbs of the traffic and passing headlights:
- take the connector combined with wires off the bulb,
- take the rubber cover off;
- take the bulb out of its seat,
- place the new bulb, pay attention so that special shape of the bulb-holder hit in adequately shaped seat of the headlight.

Changing bulbs in particular lamps consists in taking the shade off and replacing the bulb into new one, accordingly with specification described in the Chapter „Wiring system" of the tractor operation manual.

After replacing any bulb, check (set) the lights setting.

OPERATION No. 37. Toe-in of the front axle

ATTENTION! Before setting about adjusting front wheel track, you must stop the engine and brake the wheels with use of parking brake.



Before setting about adjusting toe-in, you must position the tractor on flat, level and hard ground and front wheels set for driving forward (in central position). Then you must take following action:
- take the joint **1** of the steering rod ending out of the steering arm;
- unscrew the securing nut **2**;
- set desired toe-in by turning the joint **1** of the steering rod ending (screwing it in or out of the steering rod **3**);
- verification of toe-in consists in measurement of height of wheel center, distance **B** between inside edges of wheel rims (but not tyres), marking the place of measurement (with chalk), rolling the tractor for half a turn and measuring distance **A** in previously marked spots;
- the difference between readings **B** and **A** (**B** - **A**) in the toe-in value of the front wheels and it should amount to **0 ÷ 10 mm**.
- after having the toe-in set, screw the securing nut **1** tight.

ATTENTION ! After each change of front wheel track, you must set its toe-in.

RECOMMENDED FUEL, OILS, GREASES AND OPERATING LIQUIDS APPLIED IN TRACTORS ZEFIR

Application	Amount In dm^3	Brand name
Fuel tank	155	Diesel oil: DL- in summer DZ –in winter
Engine	18	CD Class acc. API SAE 15W-40 eg. LOTOS FALCO
Air filter (wet)	approx. 1	API SAE 15W-40
Cooling system of the engine	16	BORYGO
Steering system	4	CD Class acc. API SAE 15W-40
Hydraulic system together with lubrication system of the gear-box and rear axle	54*	LOTOS AGROL U HLP / CLP
Assisting system of brakes	0,5	Hydraulic oil SAE 10W
Front driving axle Main gear: Wheel reduction gears:	5 1x2=2	LOTOS AGROL U HLP / CLP
Front windscreen washer	approx. 2	Liquid for windsreen washer
Lubrication points	-	ŁT–42, ŁT–43

*- in case of installation of front three-point hang-up system refill the system with additional 2 l of liquid.

PREPARING THE TRACTOR FOR LONG-LASTING STORING

Preparing the tractor for long-lasting storing requires aftermentioned activities:

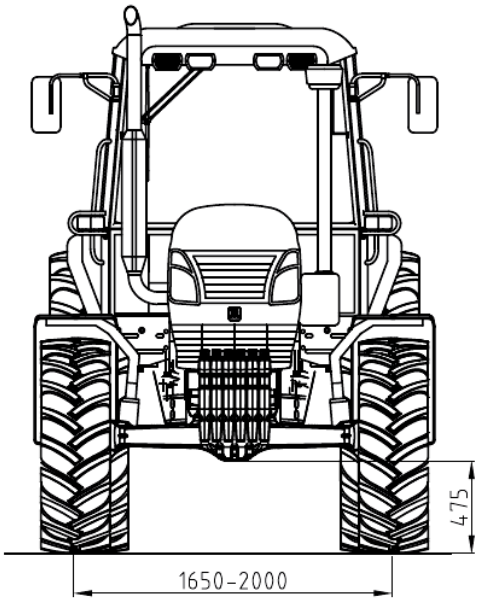
- washing the tractor;
- cleaning all lubricating nozzles;
- positioning the tractor in dry, cool and closed room;
- draining oil from the engine, driving as well as hydraulic system, and then filling those systems up with fresh oil;
- draining fuel from the fuel tank, removing deposits from the filters and filling fuel system up with 10 dm^3(l) of fresh fuel. After filling the system up, start the engine ant let it run for about 10 min. It is recommended to use special fuel plus preservative agents;
- draining the liquid from engine cooling system and cab heating system;
- loosen the v-belt of the a.c. generator;
- zasłonięcia wylotu rury wydechowej;
- dismantling the battery and placing it in warm, dry place with possibility of periodic recharging;
- positioning the tractor upon supports placed under driving axles, so that tyres were not loaded and lowering tyre pressure up to 70% of working pressure value.

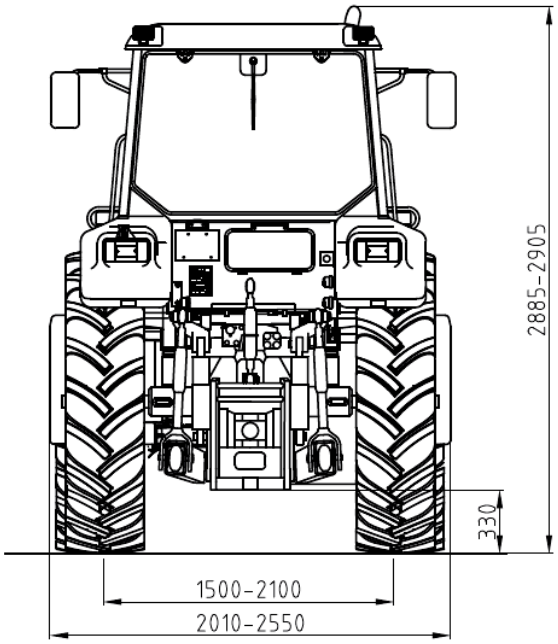
PREPARING THE TRACTOR FOR OPERATION AFTER LONG-LASTING STORAGE

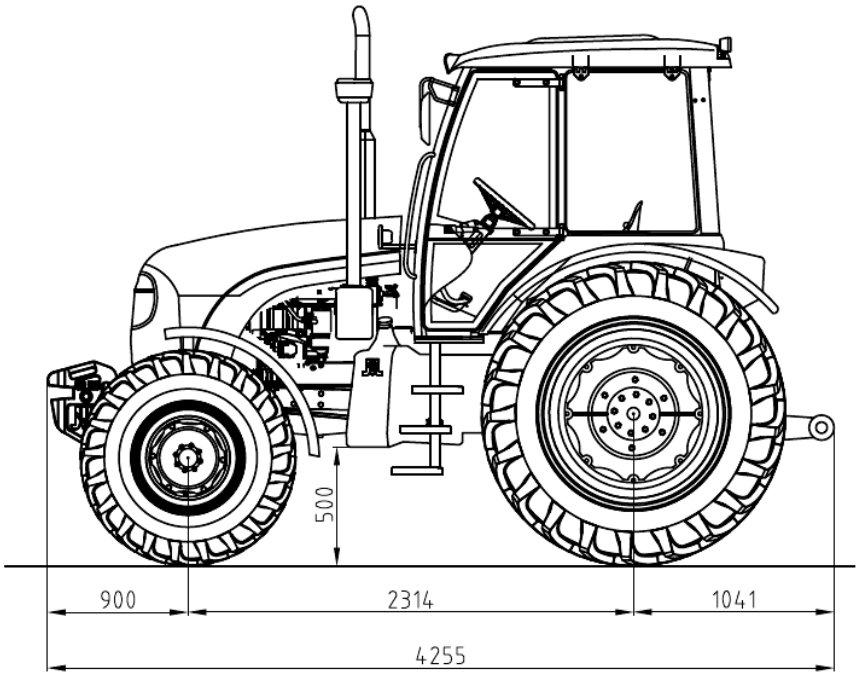
Preparing the tractor for operation after long-lasting storage requires aftermantioned activities:

- inflating tyres up to the value required for normal operation;
- taking the tractor off supports;
- filling the fuel tank up;
- filling the cooling and heating system up with coolant;
- mounting fully charged battery;
- inspecting oil level in all assemblies of the tractor (engine, driving system, hydraulic system, front axle and its wheel reduction gears);
- taking the cover off the exhaust pipe;
- starting the engine and verifying the correctmess of readings of measuring and control devices, as well as steering elements operation;
- taking the test drive, without load, for the purpose of making sure the tractor and all its assmeblies work properly.

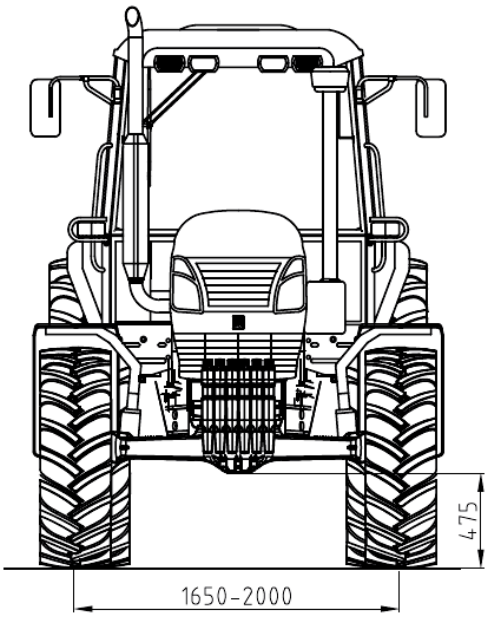
DIMENSIONS OF ZEFIR 85

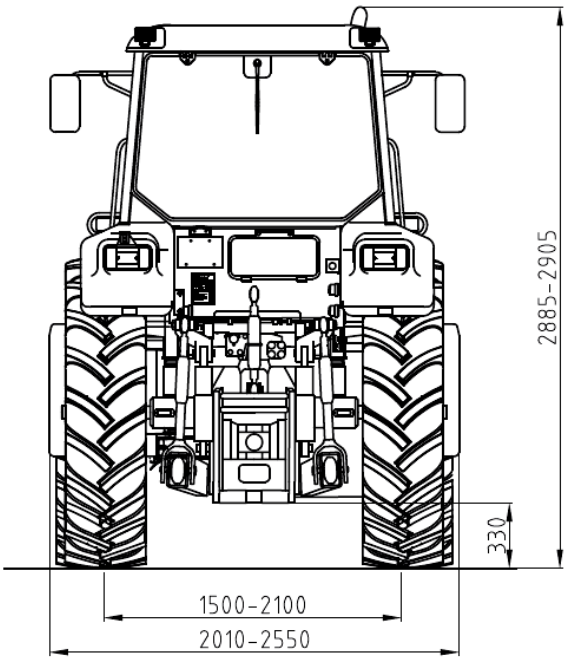


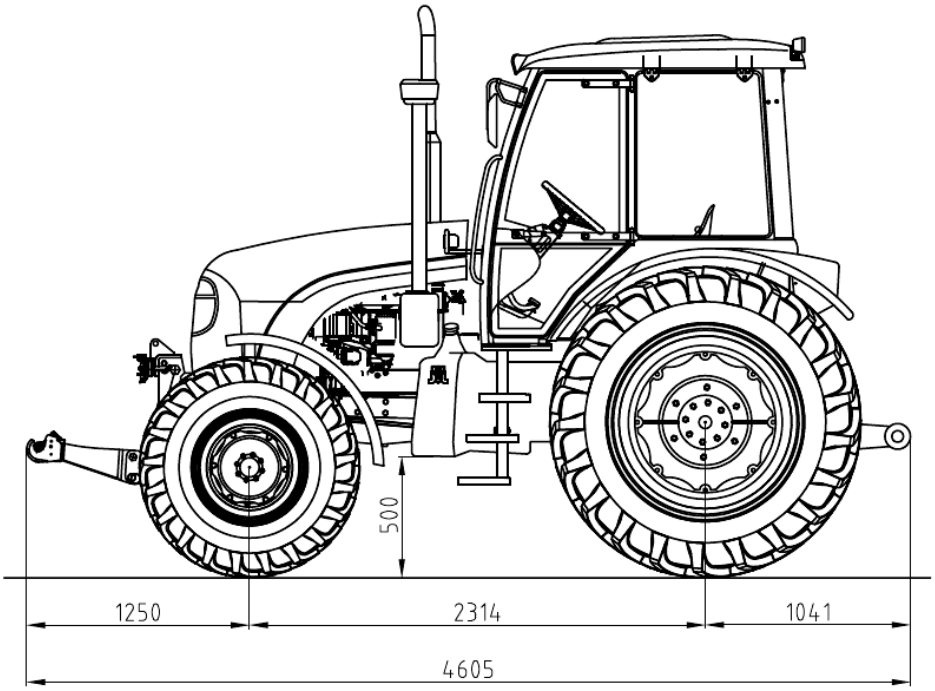




DIMENSIONS OF ZEFIR 85K







Engine	
Manufacturer	Yituo (Luoyang)Diesel Engine Co. Ltd
Type	6YTDL4.75N01
Power (kW/KM) according to 97/68/EC	62,5 / 84,9
Nominal revolutions (min^{-1})	2400
Number of cylinders	4
Piston diameter/stroke/swept capacity ($mm/mm/cm^2$)	110/125/4750
Compression ratio	18:1
Fuel consumption (g/kWh)	≤228
Max. turning effort/revolutions (Nm/ min^{-1})	287/1400
Fuel tank capacity (dm^3)	155
Power transmission system	
- number of gears (forward/backward)	12/4
- Speed range (km/h)	1,7-28,4
Reducer:	Three-stage
Differential gear lock of the rear axle	Mechanical
Clutch:	Single-plate, friction, dry
Rear power take-off shaft	
- way of switching on	Mechanically
- speed range (min^{-1})	Independent:540/1000 Dependent on the road
Dimensions ang weights	
Weight (without rear weights)(kg): - ZEFIR 85 - ZEFIR 85K	 4550 4345
Tyre dimensions – front/rear axle	11.2-24 / 13.6-38 lub 11.2-24 / 16.9-30 lub 14.9R24 / 18.4R34 lub 380/70R24 / 18.4R34
Wheelbase (mm)	2314
Wheel track – front/rear axle (mm)	1650-2000/1500-2100
Maximum turning angle of front wheels	50^o
ATTENTION: all dimensions relate to tractor with standard tyres 11.2-24 / 13.6-38	
Hydraulic system	
- oil tank capacity (dm^3)	49,4
- pressure (MPa)	16
- delivery of a pump l/min	46
- controlling rear three-point hang-up system	Mechanically
- number of sections of hydraulic divider	3
- carrying capacity of the rear three-point hang-up system in the axis of endings (kg)	3000
- category of the three-point hang-up system	II
Braking system	
- working brakes	Mechanical, disk, wet, hydraulically-controlled
- braking system of trailers	Pneumatic, two-pipe or two-pipe + single-pipe
Wiring system	
- a.c. generator	95A-14V
- starter	3,7kW-12V
Cab	- high-yield airing and heating systems - ergonomic control panels - changeable location of indicators panel along with steering column - side hopper windows and rear hopper windscreen

ATTENTION: Due to the permanent develompent and modernization of PRONAR products, technical data of manufactured tractors may differ in terms of some details from abovementioned.