

437041 MAZ TRUCK

OPERATION MANUAL

MAZ
MINSK
BELARUS REPUBLIC

INTRODUCTION

The truck of middle payload MAZ-437041 is a two-axle 4x2 truck with three-seat tilting cab located above the engine, platform with drop-head. The truck is intended for carrying various cargoes of general-network roads.

SAFETY REQUIREMENTS AND WARNINGS

The prerequisite for proper operation and reliable functioning of the vehicle is being familiar with the construction of its units and design as well as strict observation of the vehicle maintenance and care instructions.

Prior to operation of the truck, it is necessary to study carefully its construction and the guidelines for its operation, maintenance and care for it stated in this Operation Manual while paying special attention to the section «Truck Operation Peculiarities».

1. The meanings of the symbols on the monitoring devices are given in Appendix 2.

2. During the running-in period (the first 1,000 km of run), it is necessary to meet strictly the conditions given in Section «Running-In the Truck» because the further serviceability of its component parts depend to great extent on the quality of running-in of the parts within the initial period of operation.

3. The units and assemblies of the truck shall be lubricated in accordance with the guidelines given in the Lubrication Chart of this Manual. Using contaminated oils or greases or those not recommended by this Manual is **not allowed**.

4. The movement of the truck is not allowed, if the air pressure in the pneumatic brake actuator circuits is less than 490 kPa (5.0 kgf/cm²), i.e. until the indicator lamps of the respective circuits become dim.

5. When breaking away on a slippery section of the road, it is necessary to engage the differential hold. After overcoming such a section, the differential hold shall be disengaged. No turn of the truck with the differential hold engaged is allowed.

6. When driving the truck, it is necessary to watch the indications of the monitoring instruments and lamps.

7. Coasting of the truck with stopped engine and disengaged gearbox is not allowed, otherwise the steering booster will be disabled and the replenishment of the receivers of the air actuator of the brake with air will be stopped.

8. When moving downhill, it is necessary to exclude the truck movement with the engine rotational speed exceeding the allowable value, i.e. the tachometer pointer shall not enter the red zone of the instrument scale.

9. It is not allowed to drive the truck on the general-use roads with the axle loads exceeding those set by the road legislation.

10. It is not allowed to drive the truck with defective or failed steering booster. When driving the truck, the key should not be pulled out from the

key switch of the starter and instrumentation; otherwise the steering column could be interlocked.

11. To avoid the failure of the steering booster pump, the steering wheel should not be held at extreme positions (in case of maximum turn of the steerable wheels to the left or right) for more than 5 s.

12. When the truck stands still in the parking zone, the batteries should be disconnected using the battery switch. It is forbidden to connect the electric appliances with the supply voltage of 12 V (radio cassette players, receiver, etc.)

13. It is necessary to keep to the scope and intervals of the truck maintenance specified in this Manual.

14. The power plant maintenance shall be performed on a horizontal place with the cab tilted **completely**. It is strictly forbidden to stay under the cab tilted incompletely.

15. The cab shall be tilted on a flat horizontal place. The parking brake shall be applied. Prior to tilting the cab, set obligatorily the shift lever to the neutral position, close the doors and open the front grille.

16. It is prohibited to tilt and to lower the cab with the engine running as well as to start the engine with the cab tilted to avoid the spontaneous engagement of the gear box and, as a consequence, unauthorized beginning the movement of the truck.

17. After lowering the cab, make sure that the locking mechanism is closed and the rear safety rope is fixed.

18. When washing the truck, avoid direct contact of water with the electric appliances and electric wiring connection places.

19. The serviceability of the electric equipment system and circuits should not be checked using a megger or lamp with the supply voltage exceeding 24 V.

20. The wires should not be disconnected from the alternator and battery leads when the engine is running.

21. Prior to performing the welding works on the truck, it is necessary to disconnect the batteries and take the wires off from the «plus» and «minus» terminals. Disconnect the alternator plant and all electronic components.

22. Neither starting the engine from an external source, not using the truck's on-board mains as an external source for starting the engine is allowed.

23. It is prohibited to use the handle of the cab heater cock when the Hydronic-10 or Thermo 90S pre-heater is on.

TECHNICAL DATA

Weight of the cargo carried by the truck, kg	4450
Weight of the equipped truck (chassis), kg	5500
Gross weight of the truck, kg	10100
Distribution of the gross weight of the truck on the road, kg:	
- through the front axle tires	3750
- through the rear axle tires	6350
Base, mm	3700
Radius of turning about the axis of the front external wheel trace, m	7.3
Maximum speed, km/h	100
Control fuel consumption, l/100 km (at constant speed 60 km/h on the plane road with hard surface)	15*

* The control fuel consumption is used for defining technical condition of the automobile and it is not an operation standard.

ENGINE

Model	Ì Ì Ç-Ä30Å2
Power, kW at 2400 min ⁻¹	115

POWER TRAIN

Clutch	dry, single-disc
Gearbox	5-step
Propeller gear	two propeller shafts of open type with hinges on needle bearings and intermediate support.
Rear axle	central conic reduction gear with hypoid displacement has interwheel differential with blocking.
Axle ratio	4.44

UNDERCARRIAGE

Frame	ladder-type frame with two side members of channel section with cross-members and with straight top and low sides.
-------	--

Front suspension	dependent, spring type.
Rear suspension	dependent, spring type.
Front axle	with steerable wheels. H- section beam.
- Wheel turning angle	($42 \pm 1^\circ$ for the internal wheel)
- Wheel toe-in (on brake drum faces), mm.	0.5...1.0
Wheels	disk type, rim size 6.0-20
Tires	Size 8.25R20 130/125K, with universal protector pattern, HC12.
Spare wheel	on the holder of driving axle back side.
Pressure in tires, kPa	
- of front axle wheels	600 ± 20
- of rear axle wheels	520 ± 20

CONTROL MECHANISMS

Steering	Steering gear with built-in hydraulic control valve. Steering ratio 23.55. The steering wheel booster is the power hydraulic cylinder. The driving booster pump is of gear type.
Service system of the pneumatic brake actuator	Two-circuit, with separate circuits of brake actuators for the front axle and driving one with the ABS system.
Reserve system of pneumatic brake actuator	Any serviceable circuit of the service braking system and parking brake.
Parking brake	on rear wheels, actuated from energy accumulator springs.

ELECTRIC EQUIPMENT

Rated voltage, V	24
Alternator	Ã994.3701-1alternate current, with integrated voltage regulator.
Storage batteries	Two sets, 6CT-110
Starter	ÑÒ-142Ê with electromagnetic switching mechanism.
Headlamps	Two headlamps, 341.3711 European asymmetric light with halogen lamp H4.
Rear lamps	7402.3716 and 7412.3716 as rear side light, rear fog lamp, circuit light, stop light, turning indicator, rear lamp.
Cab lighting	Integrated ceiling lamp
Horn	Vibration type
Cab	All metal, two-door, three seats, tilted forward with the hydraulic lifting mechanism.
Platform	Wit drop-head and steel sides. Jump seats along the sides.

CONTROLS AND INSTRUMENTATION

The layout of controls and instrumentation of the trucks is shown in the Figs. 1 and 2.

To provide the control of the truck's devices and instrumentation, all push-button switches and indicators on the main and additional dash-boards have illumination. Illumination is switched on when the side lights are switched on and its brightness is adjustable by means of the illumination rheostat.

Instruments and starter switch (lock) 1 on the steering column with an anti-theft device.

The key is to be inserted and pulled out when in the position III (Fig. 1)

To unlock the steering column shaft, insert the key into the switch lock, and turn slightly the steering wheel to the left-right (to avoid breakage of the key) and then turn the key clockwise to the «0» position.

When the key is taken out of the switch lock (from the position III) the locking device of the switch lock snaps into action. To lock the steering column shaft, it is necessary to turn slightly the steering wheel to the left-right.

Other positions of the key in the switch lock:

0 - neutral (fixed) position, the instruments and starter circuits are disconnected, the engine is stopped;

I - instruments and devices circuits are enabled (fixed position);

II - instruments, devices and starter circuits are enabled (non-fixed position);

Windshield wiper and washer selector switch lever is located on the steering column and has the following positions:

In horizontal plane:

0 - neutral;

I - fixed, the windshield wiper is on - slow motion;

II - fixed, the windshield wiper is on - fast motion;

III - fixed, the windshield wiper is on - intermittent operation mode.

In vertical plane:

IV - non-fixed, the windshield washer is on with simultaneous slow motion operation of the wiper.

When the handle is pressed on the face, the electric horn snaps into action.

Turn indicators, lower and high beams switch handle 2. It is located on the steering column and has the following positions:

In horizontal plane:

0 - neutral;

I - fixed, the right turn indicators are switched on. Switching off is automatic;

II - non-fixed, the right turn indicators are switched on for a short period of time;

III - non-fixed, the left turn indicators are switched on for a short period of time;

IV - fixed, the left turn indicators are switched on. Switching off is automatic.

In vertical plane:

V - non-fixed, switching on of high beams for a short period of time;

O - fixed, lower beams are switched on when the main switch of the headlamps lights is on;

When the handle is pressed on the face the electric horn snaps into action.

Cab heater and ventilation shutters control panel 4:

I -heater control valve drive handle;

II - handle drive shutter of the air-blowing over the passenger's feet;

III - handle drive shutter of the air blowing over the driver's feet;

IV - heater air vent shutter drive handle.

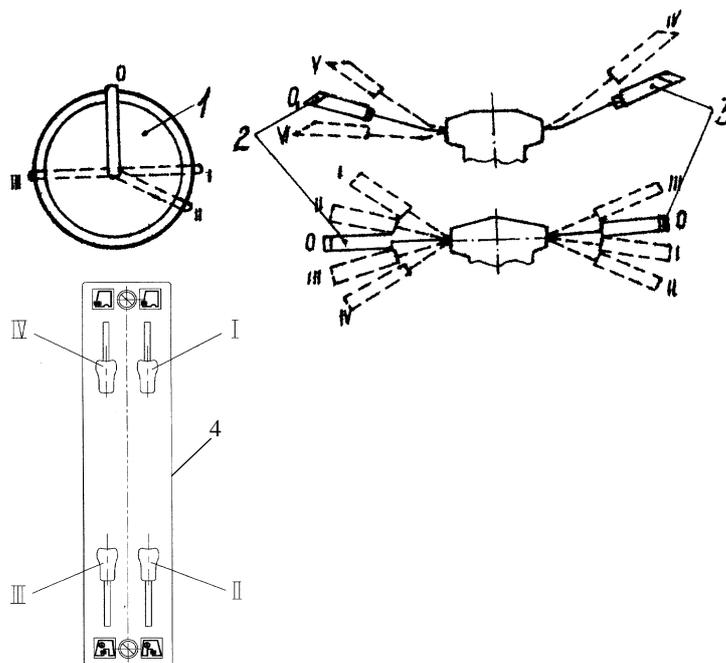


Fig. 1. Controls:

1 - Instruments and starter switch with anti-theft device; 2 - switch of the headlamps, turn indicators and horn; 3 - windshield wiper and washer selector switch handle, horn; 4 - cab heater shutters and ventilation systems control panels.

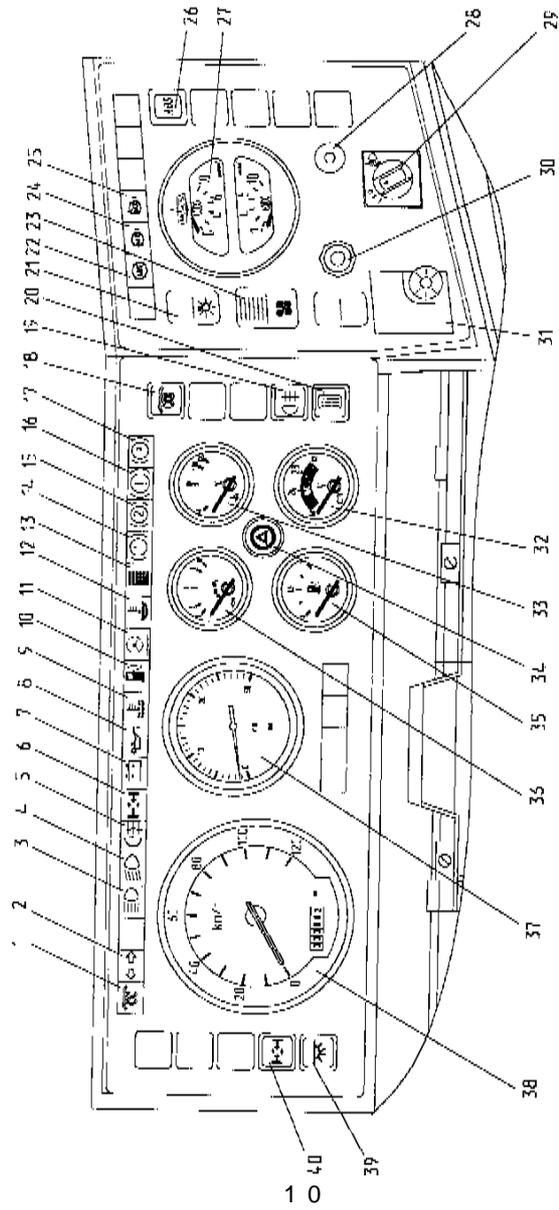


Fig.2. Dashboard:

1 - control lamp of the electric torch (glow plugs); 2 - control lamp of the truck turn indicators; 3 - headlights high beam control lamp; 4 - headlights lower beam control lamp; 5 - tail fog light control lamp; 6 - interwheel differential blocking control lamp; 7 - batteries charge control lamp; 8 - engine oil pressure control lamp; 9 - control lamp of the emergency temperature in the engine cooling system; 10 - fuel level control lamp (below the reserve one); 11 - control lamp of the decrease of the fluid level in the hydraulic booster; 12 - control lamp of the coolant level decrease; 13 - control lamp of the air filter loading; 14 - control lamp of the air pressure drop in the front circuit of the pneumatic brake actuator; 15 - control lamp of the air pressure drop in the rear circuit of the pneumatic brake actuator; 16 - control lamp of the service brakes faultiness; 17 - control lamp of applying the parking brake; 18 - electric torch (glow plugs) switch; 19 - tail fog light switch; 20 - mirrors heater switch; 21 - main light switch (top position - OFF; medium position - marker lights; lower position - high/lover beam of the headlights; 22 - control lamp of the prime mover's ABS system; 23 - switch of the cab heater fans operating mode (upper position - off; medium position - fast; lower position - slow); 24 - control lamp of the trailer's ABS system; 25 - control lamp of the integrity of the connection with the trailer's ABS system; 26 - ABS mode switch; 27 - two-pointer pressure gauge in the front and rear circuits of the brake system; 28 - rheostat of the instrument scales illumination; 29 - headlight beam corrector (if provided); 30 - battery disconnection switch; 31 - heat controller of an independent heater D9W or thermo 90S (if provided on the customer's request); 32 - voltage indicator; 33 - coolant temperature indicator; 34 - alarm signalling switch; 35 - fuel level gauge; 36 - indicator of the oil pressure in the engine lubrication system; 37 - tachometer; 38 - speedometer; 39 - engine dome switch; 40 - interwheel differential blocking switch.

CAB ACCESSORIES

The rear-view mirrors are installed outside the cab on its both sides. The mirrors are adjustable in position.

The electrically driven two-speed three-blade windshield wiper is intended for cleaning the windshield and is switched on by the handle 3 (Fig.1) located on the right-hand side of the steering column.

The electrically driven windshield washer. The pump of the windshield washer is switched on by the same handle as the windshield wiper. A water stream jet is directed from a reservoir through two nozzles onto the windshield. When the handle is released, the pump is switched off. The direction of the stream jets is adjustable by turning the nozzles.

The driver seat is equipped with a cushioning mechanism fitted with pneumatic resilient component 4 (Fig. 3) and has vertical and horizontal adjustment mechanisms and the seat back tilt adjustment mechanism.

The pneumatic resilient component controlled by a distributor is adjustable by height regardless of a driver weight. The seat is adjusted by rotating the distributor rod until the size 150 ± 2 mm on the resilient component 4 is reached. The seat vertical adjustment mechanism is of lever type, fitted with step fixing and it allows the adjustment of the pad 2 tilting angle.

The mechanism of the seat horizontal adjustment is of slide type, with step fixing.

Neither front nor middle seat is adjustable.

The cab's doors consist of 2 welded metallic panels. In the middle part of the interior door panel, there are hatches for glasses window raises and drive lock mounting and stripping.

The doors are equipped with the rotor-type locks. In order to fix the door lock in a closed position from inside of the cab, it is necessary to turn the driving handle of the lock down against stop and then, holding the handle, to smoothly return it to the initial position.

The window raiser is of cable drum type with 2 guide rollers. The lower roller is fitted with the cable tension adjustment device. The necessity of adjustment of the tension is defined by the value of the movable glass run under the action of pressing hand. The run shall not exceed 5... 10 mm.

The heating and ventilation system includes the heater, inlet and outlet hoses, frame accessories, air pipes and shutters, heating glasses and driver's feet.

The heater electric motors are switched on by setting the mode 1500 or 3000 rpm. The hot fluid can be taken from the engine cooling system.

The cab ventilation in summer can be realized by door glass drop or by opening the ventilation hatch on the cab top.

The heating system ventilation can be also used when coolant feeding is switched off.

Sun visors. Two sun visors are installed inside the cab in front of the driver and passenger seats. The sun visors are raised and lowered by hand.

The radio set or radio-tape recorder are installed in the cab on the packet shelf at the customer's request.

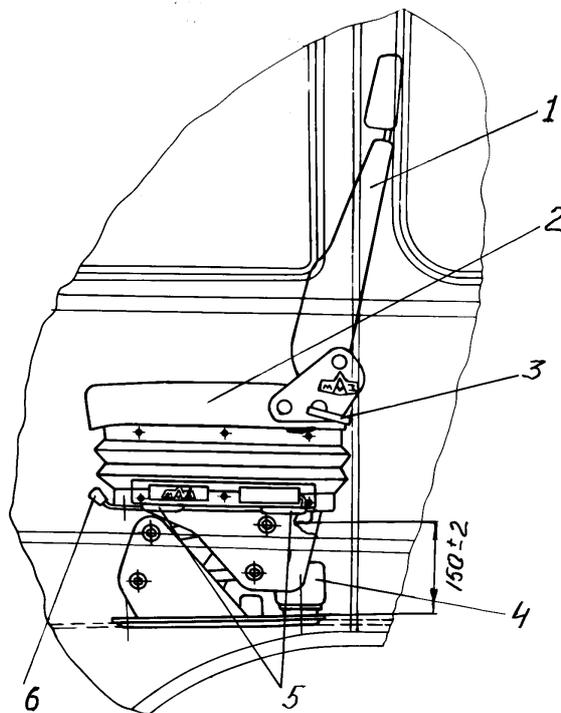


Fig. 3. Driver Seat

1 - back; 2 - cushion; 3 - seat back adjusting handle; 4 - pneumatic resilient element; 5 - vertical adjusting mechanism handles; 6 - horizontal adjusting mechanism handle.

PRE-SALE PREPARATION WORK LIST

1. Depreservation (removal of anticorrosive compounds).
2. Visual inspection of appearance of the unit to make sure there is no transportation damage. Check of accessories, tools and manuals in accordance with the packing list.
3. Reinstallation of the components and accessories dismantled for the period of transportation.
4. Inspection of presence and levels of oils in units and assemblies. Add oil, if necessary.
5. Add coolant (if necessary).
6. Check the storage batteries condition, and the way they secured (when necessary add electrolyte, recharge, secure).
7. Check operation of pneumatic brakes, clutch actuation, electrical equipment, signal/horns, cab-tilting system, pressure in tires, safety of wheels attachment, and other connections and attachments. Correct the problems, if necessary.
8. Check the serviceability of the units, components and systems in all operation modes. Correct the problems, if necessary.
9. Check the operation of the steering gears in the running engine mode (rotating steering wheel). Correct the problems, if necessary.
10. Inspect the truck from the bottom (check of leakage of coolant, oil and fuel, reliability of the joints and attachments. Correct the problems, if necessary).
11. Washing of the truck and tinting, if necessary.
12. Briefing of the owner and driver.

RUNNING IN OF THE TRUCK

The durability and reliability of the units and mechanisms as well as the truck operation profitability depend to great extent on the quality of running-in of the parts within the initial period of operation.

Within the running-in period, it is necessary to pay special attention to the condition of all fastenings and tighten the bolt connections having been loosened, monitor the units heating degree and, if it is excessive, to ascertain the reason and to eliminate the fault.

On the new trucks and after replacement of the wheels, it is necessary to tight the wheel nuts after approximately 50 km of run. Then the wheel nuts

shall be tightened everyday with applying the equal tightening torque until the tight abutment is achieved.

The running-in period for new trucks is 1,000 km of run.

Then following limitations are set for the running-in period.

- the truck shall be driven in the part-load running-in mode;
- the weight of the cargo carried shall not exceed 60% of the rated value;
- the driving speed at each gear shall not exceed 3/4 of the maximum allowable speed of movement or maximum allowable crankshaft rotational speed.
- towing a loaded trailer is prohibited.

After the 1,000 km of run, the speed may be gradually increased up to the maximum value or up to the maximum allowable crankshaft rotational speed, respectively.

During and after the running-in period, the recommendations for maintenance of the engine, clutch and gearbox shall be followed in accordance with the guidelines of the manufacturer's manuals.

Within the initial period of operation of the truck, it is necessary to perform the following maintenance works:

1. Change the oil in the truck units and systems according to the Lubrication Chart.
2. Perform the whole scope of works provided within the Maintenance A and additionally the fastening works provided within the Maintenance C.

On fulfilment of the above guidelines, the truck can be put into normal operation.

TRUCK OPERATION PECULIARITIES

PRE-OPERATION OF THE TRUCK

Prior to beginning the operation, it is recommended to carry out the preparatory work related to monitoring and filling of the truck with operation materials.

Depending on trucks transportation conditions, the storage batteries can be installed with or without the electrolyte. Put storage batteries not filled with the electrolyte, into operational status and, if necessary, adjust the density of the electrolyte to be filled. Besides, check up:

- presence of the coolant and its level in the extension tank and, if necessary, replenish it;

- oil level in the engine oil pan, gearbox, driving axle, steering hydraulic booster system and, if necessary, add oil up to the required level;
- tension of the alternator drive belt;
- air pressure in tires and, if necessary, make it normal.

After the fuel tanks are filled, fill engine feed system with fuel. To do this, turn the handle of the hand-operated fuel pump on high pressure fuel pump and, while moving it up and down, pump the system during 2 - 3 min. Then turn the handle of the hand-operated fuel pump against the stop.

Filling the engine with oil and checking the oil level. To check the oil level in the engine oil pan, open the cab front grille, pull out the oil dipstick from the flexible sheath, wipe it with clean rags and insert in the guide sheath as far as it will go; then pull out the dipstick once again. If the oil level is near to the «H» (low) mark, add fresh oil up to the «B» (high) mark on the oil dipstick.

Pour oil through the filler neck located under the cab front grille to the right of the radiator (when looking forward). For this purpose loosen the securing nut, pull out and turn the filling branch pipe at 180°, tighten the nut and open the cap of the filler neck. After the oil filling is over, reinstall the filler neck to the original position in the reverse order. For draining the oil, there is a draining hole, which is closed with a plug in the engine oil pan.

Starting and stopping the engine. For starting the cold engine under the ambient temperature of above minus 5°C proceed in the following sequence:

- set the gear shift lever to the neutral position;
- check the position of the engine shut-down handle (the handle shall be pushed in against the stop);
- press the ground switch button;
- switch on the instruments by turning the switch lock key to the first fixed position;
- press the accelerator pedal to the degree of moderate feed;
- switch on the starter by turning the key to the second (non-fixed) position;
- after the engine starts, release the key and make sure that the key has returned to the initial position. Immediately after the starting, release the accelerator pedal so that to avoid operation of the engine at increased rotational speed.

If the engine fails to start, make an attempt of restarting after an inter-

val of 2-3 min for which purpose repeat the above operations. Never operate the starter continuously for more than 20 seconds. If after three attempts the engine failed to be started, find out and correct the problem.

After starting, warm up the engine to the coolant temperature of 40°C by running the engine first at a minimum and then at an average rotational speed of the crankshaft.

When starting the engine after changing oil or turbo-supercharger oil filter element the engine should run for at least 2 min at minimum crankshaft rotations (for filling spaces of the turbo-supercharger bearings with oil). To avoid abnormal wear of the turbo-supercharger bearings run the engine at the crankshaft idle speed not exceeding 1000 rpm (until oil pressure shows up in the turbo-supercharger).

Starting the cold engine using the glow plugs

The engine should be started using the glow plugs at the temperatures of below 0°C.

To start the engine using the glow plugs, proceed as follows:

- set the gear shift lever to the neutral position;
- press the ground switch button;
- switch on the instruments by turning the switch lock key to the first fixed position;
- press the accelerator pedal to the degree of maximum feed;
- press the button of the glow plugs switch 8 (Fig. 2) and hold it down for 20-25 s, then switch on the starter by turning the key to the second (non-fixed) position without releasing the button of the glow plugs switch;
- after the engine starts, release the key while continuing to hold down the glow plugs switch for more about 3 min to improve the fuel combustion process in the combustion chamber warming up mode.

Heating system

The truck is equipped with the automatic liquid independent preheater D9W or Thermo 90S.

The Independent preheater is used for heating the coolant at low ambient temperatures, maintaining the thermal conditions of the engine and cab on the parking place with out-of-operation engine and during the truck movement.

The preheater is connected to the liquid cooling system.

The preheater is supplied with fuel from the separately installed fuel tank. At ambient temperatures above 0°C, any diesel fuel can be used. At

lower ambient temperatures the fuel should be used according to the following table.

Temperature	Winter diesel fuel	Additive compound
From 0°C down to -25°C	100%	
From -25°C down to -40°C	50%	50% kerosene

The system construction and rules of the preheater use are described in the separate «Preheater Operating Manual» attached to this Manual.

1. Prior to switching on the independent preheater, shift the handle 1 of the valve control lever of the cab preheater on the panel 4 (Fig.1) against stop in the direction of the symbol (up to the stop, the valve position «open»). Thus the lever on the valve (is installed on the preheater) shall be turned by the drive to the left (counter-clockwise) against stop.

The preheater valve shall be completely opened during the independent preheater operation. In case of non-complete opening, the preheater emergency disengagement and its self-blocking can occur.

Turn the switch 23 (Fig.2) of the cab preheater fans operation mode to the lower position (small speed of the fan rotation).

2. The coolant shall be clean, free of dirt and solid particles and contain all year round no less than 10% of anti-freeze for corrosion protection. At low temperatures the coolant shall contain sufficient quantity of anti-freeze.

Anti-freeze content	Ambient temperature
45 %	-31
56%	-40
65%	-60

IT IS FORBIDDEN to operate the preheater with frozen coolant.

3. It is no allowed to operate the preheater in closed premises (for example, in garage).

4. When refuelling the truck, the preheater shall be always disengaged.

5. It is forbidden to use the preheater in the places where flammable vapour or a lot of dust can be generated (for example, near fuel storages, carbon, saw dust, grain, etc.).

6. The suction hole of the air pipe for combustion and the exhaust pipe shall be clean.

When performing the welding operations on the truck, you should remove the «+»cable from the storage battery and put it on the truck mass for the preheater control unit protection.

DRIVING THE TRUCK AND MONITORING ITS SYSTEMS

The ability to drive the truck is of primary importance for its correct operation and excluding various dangerous situations (for example, truck skidding) and premature wear and damage of truck components and spare parts.

When driving the truck on slippery roads and on the most dangerous areas (snow, dirt, soft ground, sand, etc.), if necessary to disable the rear axle interwheel differential (possibility of wheelspin from one side of the truck).

At first signs of the truck skidding release the pedal of the service brake and use parking brake avoiding the skidding by turning the driven wheels in the skidding direction.

Monitoring the truck systems

While driving the truck, it is necessary to monitor the readings of the control equipment and indicating lamps signals:

- air pressure in the front and rear circuits of the pneumatic brake actuator shall be within the range 637...784 kPa.

When the air pressure in the front or rear circuits of brakes drops below 490+49 kPa, the corresponding indicating lamps light up;

- the oil pressure in the engine lubrication system at the nominal rotational speed shall be 392...588 kPa and at minimum rotational speed - 98 kPa.

When pressure drops below 78...39 kPa, the indicating lamp lights up;

- The coolant temperature when driving the completely loaded truck shall be within the range 75...100°C. When the coolant temperature exceeds 102°C, the indicating lamp lights up. The short-term permissible maximum temperature shall not exceed 105°C. That is why when the indicating lamp lights up, you should stop the truck in order to find out and eliminate the causes of the overheat;

- The fuel level in the fuel tank is monitored by the readings of the fuel level indicator, and when there is fuel reserve within 16...20%, the indicating lamp lights up.

- When the coolant level drops below the permissible value the indicating lamp lights up. If there are no visible leaks, the truck can run by its own way to the nearest filling station. If leaks are taking place, it's necessary to eliminate the cause and fill the system up to the lower edge of the filling neck, after that it is possible to continue the movement of the truck.

- The batteries charge is monitored by means of the voltage indicator. When the indicating lamp of the batteries charging lights up with the engine in operation, it means there are no troubles in the electric-power supply system (alternator doesn't supply charging current);

- If the air filter is blocked, the indicating lamp lights up.

The gearbox is equipped with gears synchronizers. Therefore the gears shifting should be performed with the clutch disengaged by smooth lever pressing without any jerks. When you feel resistance of the lever you should continue smooth pressing until the gear is engaged completely.

It is recommended to start the movement of the truck unloaded in the second gear and of the truck loaded - in the first gear. If you fail to place the lever to the required position while starting the movement, you should not try to shift the gear by sharp kicks: it's necessary to release the clutch pedal, press it once again and engage the gear again.

To speed up the synchronized gears switching and to increase the synchronizer service life, it is recommended to apply the double clutch disengagement with short-term pressing the fuel supply pedal while downshifting. To downshift, proceed as follows:

- disengage the clutch;
- set the gear shift lever to the neutral position;
- engage the clutch, and press the fuel supply pedal for short time to increase the engine rotational speed;
- release the fuel supply pedal and disengage the clutch at the same time;
- set the lever to the required position;
- release the clutch pedal and press the fuel supply pedal.

While shifting from the second to the first gear, it is necessary to apply obligatorily the double clutch disengagement with pressing the fuel supply pedal for short-term.

You can engage the reverse motion after complete stop of the truck only.

You should not hold your foot on the clutch pedal in order to avoid the clutch partial disengagement and increased wear of friction linings and premature failure of the clutch bearing.

When driving the truck, do not allow sharp deceleration and jerks. The steep grades shall be overcome in reduced gears.

When driving on long downgrades it is necessary to decrease the speed and downshift to avoid the brakes overheating. Besides it is forbidden to disengage the clutch and to shift the gears in order to avoid the trouble of the friction clutch plates.

When driving on downgrades and during coasting on the horizontal section of roads it is forbidden to stop the engine in order to prevent the stored air consumption in the brake actuator system and to stopping the operation of the steering hydraulic booster pump; it is also forbidden to disengage the gear or clutch.

In wintertime, after staying of the truck with the parking gear applied, special attention should be paid to smoothness of getting away in order to avoid breakage of parts resulting from freezing of the driving axle brake shoes to the brake drums.

The intensity of braking with the emergency brake depends on the turn angle of the control cock handle. When the handle is turned to the rear fixed position, the parking brake starts to operate. When pressure falls in the parking brake actuating circuit, there occurs braking of the truck as energy accumulators start to operate. To unbrake the truck in this case, it is necessary to unscrew the pusher bolts and exclude loading of the realizing knuckles from springs operation. (Fig. 4)

Towing of the Truck

When towing the faulty truck, the disconnected propeller shaft shall be disengaged.

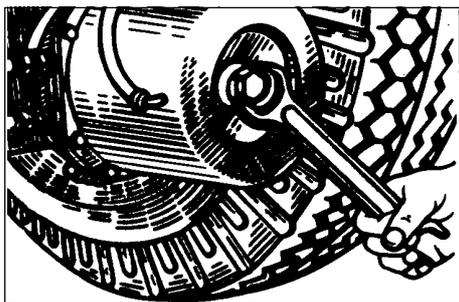


Fig. 4. Unscrewing the stop bolt of the engine energy accumulator pusher

CAB TILTING

Tilting the cab at an angle in relation to the front hinged supports provides free access to the engine and its systems, steering gear and other units located in front of the chassis.

Prior to tilting the cab, raise the cab grille (to avoid its damage); to do this, pull to yourself two handles that are located in the lower right and left positions behind the grille while standing in front of the cab and raise the grille in the upper position. Take out of the holder the cab tilt pump drive handle (it is secured behind the grille on the left (when looking forward)).

Set the gear shift lever to the neutral position, remove the safety rope from the pin on the cab and, using the handle drawn out from under the grille, unlock the latching gear. To do this, insert the handle into the bushing 2 (Fig.5) and move it downward against the stop.

Tilting the cab. To tilt the cab, turn the pump control valve handle to the TILT position, and then, making use of the handle inserted into the hole of the pump driving shaft, actuate the pump until the cab is completely tilted.

After the unstable equilibrium position, the further tilting of the cab goes on automatically. If necessary to stop the automatic tilting process, shift the pump regulator handle to the LOWERING position.

Lowering the cab. To lower the cab, turn the pump regulator handle to the LOWERING (Í Ì ÓÑÊÀÍ ÈÅ) position and lower the cab in a similar way. After the cab is lowered to the extreme down position, the locking gear snaps into action automatically. Then put the safety rope onto the pin on the cab.

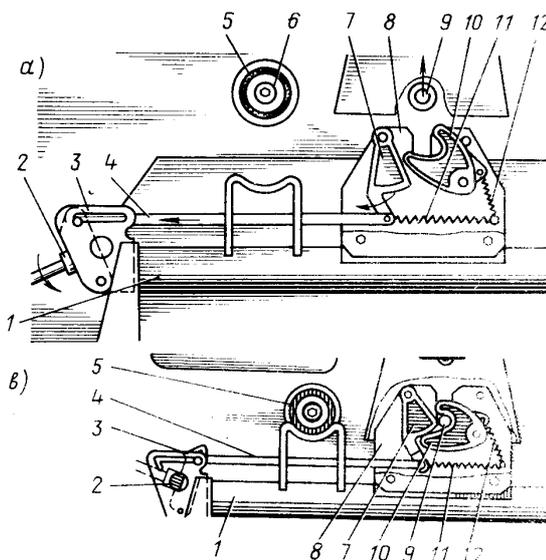
Carry out all the maintenance operations concerning the power unit only when the cab is completely tilted.

SECURING SPARE WHEEL

The spare wheel is secured on the rear end of the right side-member on the special bracket in the following sequence:

- Install the wheel central hole on the angle bar, as shown in Fig.6.
- Shift the wheel into the horizontal position until the disc is in contact with the bracket 1.
- Pull the wheel and mate holes in disc with the holes in the bracket 1.

Fig. 5 Cab locking mechanism:
 a) locking mechanism is opened; b) locking mechanism is closed:
 1 - beam; 2 - bushing with lever; 3 - bracket; 4 - rod; 5 - support; 6 - washer; 7 - cam; 8 - cheek plate; 9 - pin; 10 - grip; 11, 12 - springs



- Install the plate 5 into the bracket holes by bolts and fasten the wheel by the nuts 2 having put the washers under them.

The wheel removal is to be executed in the reverse order.

To the driver's attention!

When installing the wheel ensure that it would not run off from the angle bar, particularly in the moment of the wheel mounting and stripping as well as during its shifting from the vertical to horizontal position and vice versa.

In order to avoid falling of the plate and therefore traumas it is necessary to hold it by hand while the wheel mounting and stripping.

TIRES MOUNTING AND STRIPPING

With operating the automobile tires, follow the following main rules:

1. Every day, before driving the truck, check the pressure in the tires and, if necessary, make it normal. Decrease of the internal pressure in tires

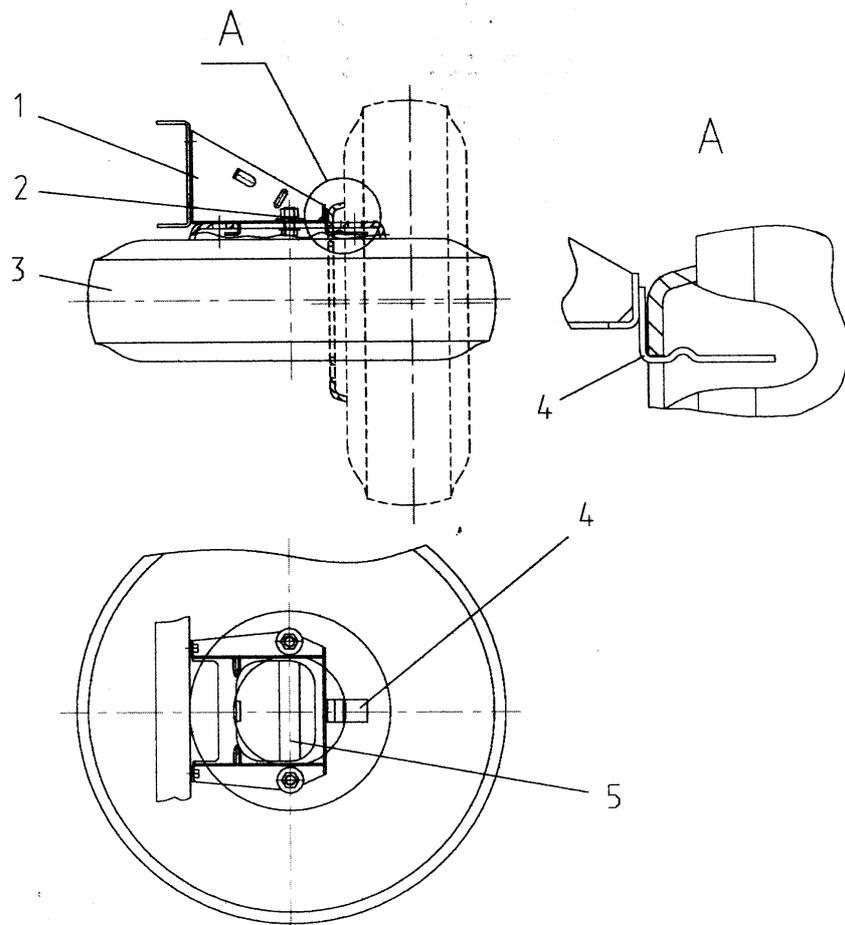


Fig. 6. Spare wheel securing
1 - bracket; 2 - nuts; 3 - wheel; 4 - angle bar; 5 - plate

against the norm by 25% lowers the service life by approximately 25...40%.

2. Do not overload the tires. Do not exceed the nominal load carrying capacity of the truck. Tires overloading by 25% decreases their service life by approximately 40%.

3. Brake the truck smoothly; do not allow the wheels to slip, because it results in the increased wear of the tread.

4. Put on anti-slip chains only if there is the necessity in them and put them off as soon as such necessity is eliminated.

5. Do not allow ingress of fuel, oil and other petroleum products onto the tires as it can quickly make them out of order.

6. Do not allow installation of tire of different dimensions, diagonal and radial design as well as tires with different types of the tread pattern on one axle, on dual wheels and truck axles.

Difference in depth of the tread pattern of dual tires shall not exceed 5 mm (while groove measuring of the tire pattern centre). Large difference results in constant operation of the differential gears, their excessive wear and friction losses.

Carry out tires rearrangement if there is technical need (tires damage, need of the appropriate choice of dual tires, operation of more reliable tires on the front axle, irregular intensive wear of the tires tread pattern and others).

During tire mounting-stripping it is strictly forbidden to:

- put the wheel off from the hub without full deflating of the tire, as well as to start the tire stripping from the rim without making sure that the tire is fully deflated; for convenience of tyres inflating and deflating, the internal wheels are equipped with the valve extension.

- use hammers, crow-bars and other heavy things that could deform wheel parts;

- mount the tire on improper wheel rim;

- use the tyres which sides have scores and damages that prevent the mounting process;

- start the tire inflating without making sure that it has taken the appropriate position on the rim;

- inflate the tire out of the special enclosure and the one installed on the wheel hub, and in road conditions without observance of safety regulations;

- dismount one of the dual wheels without usage of the jack, by run of the second wheel over the bulged things.

Tire Mounting Procedure:

1. Prior to mounting the tyre, it is necessary to check the integrity and cleanness of the rim. The rim shall have regular shape and be free of dents or other damages as well as of rust and dirt. Then powder slightly the internal surface of the tire cover and the tube with talc and check the condition of the flap.
2. Place the wheel rim onto the floor with its lock part (groove) directed upwards. Place the tire onto the rim and insert the valve into the valve slot of the rim. Then lift slightly the tire from the valve side and draw its opposite side onto the rim.
3. Insert the bead ring into the tire and step on it in such a way that the tire would be drawn downwards. Then insert one end of the bead ring into the lock groove of the rim and press it into the tire by foots until it is fit completely in the lock grove. If the force applied by feet is insufficient for fitting the bead ring, it is necessary to fit it by blowing with hammer taking care to prevent the damage of the bead ring.
4. Turn over the wheel with the bead ring directed downwards and inflate the tire to the pressure of 1.5 kg/cm². Then check the fitting of the bead ring in the lock groove once again and inflate the tire to the recommended pressure. The tire bead shall be fit completely to the shelves of the rim and ring.
5. Screw the cap onto the valve to protect the slide valve against dirt and damages as well as to prevent the air leakage from the tube.

Tire Stripping Procedure:

1. Deflate the tires completely.
2. Release the bead ring from the tire. To do this, insert the flat blade between the bead ring and the tire and press the tire bed downwards (See Fig. 7a).
3. Insert the fork blade between the bead ring and the tire in such a way that the flat blade would be in the fork blade slot (See Fig. 7b). Then press the tire bead downwards using a fork blade (see Fig. 7c) and continue this operation consequently over the whole tire cover until the tyre bead is removed from the conical shelf of the bead ring. Proceed to removing the bead ring.
4. Insert the thin end of the blade into the gap between the ends of the

bead ring and press one end of the ring from the lock groove of the rim (see Fig. 7d).

5. Release the ring by pressing gradually the bead ring from the lock groove of the rim .

6. Remove the wheel rim from the tire cover. To do this, turn the wheel over and release the tire beads in the same way as the bead rings were.

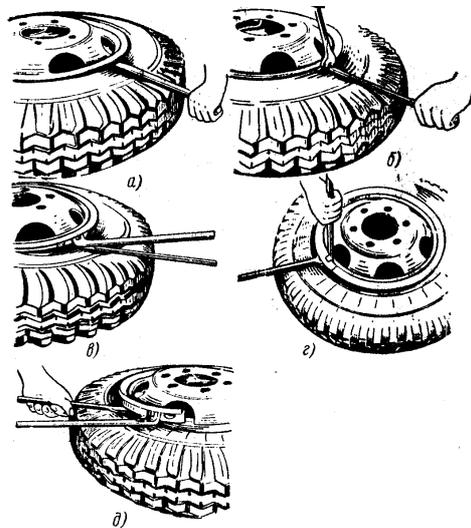


Fig. 7. Operations sequence when stripping the tire

ADJUSTMENTS

Fuel Supply Control Actuator and Its Adjustment

The fuel supply control actuator is shown in Fig. 8. The fuel supply actuator is controlled as follows:

- When the pedal is pressed against the stop, the fuel injection pump lever 5 shall thrust against the bolt for limiting the maximum rotational speed of the crankshaft. When the pedal is released, the lever shall thrust against the bolt for limiting the minimum rotational speed of the crankshaft. If these conditions are not met, change the length of the cable for which purpose as follows:

- disconnect the fork 3 from the lever 2, set the accelerator pedal 1 in the extreme upper position against the stop;
- when the fuel injection pump lever 5 thrusts against the bolt for limiting the minimum rotational speed of the crankshaft, align the holes in the fork 3 and the lever 2 by rotating;
- couple the above parts;

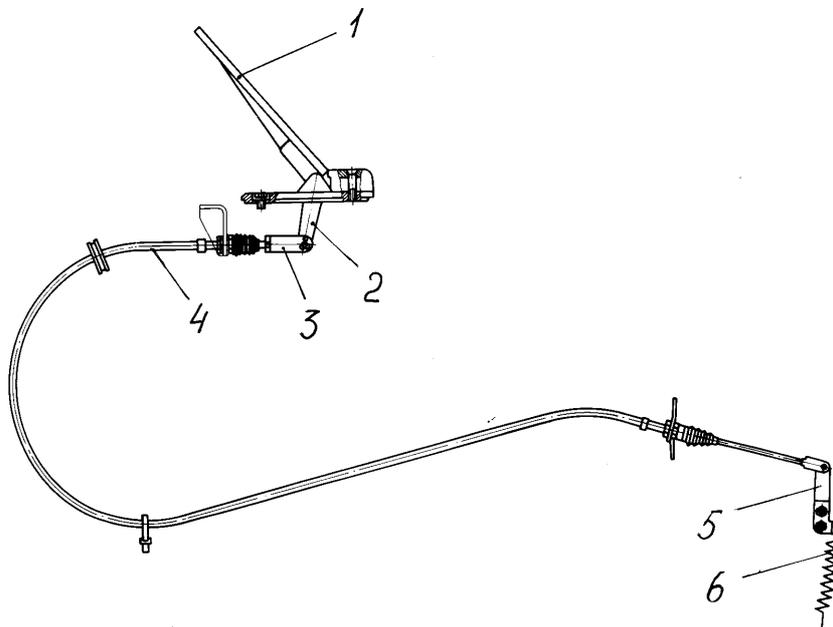


Fig. 8. Fuel supply control drive:

1 - pedal; 2 and 5 - levers; 3 - fork; 4 - cable; 5 - block; 6 - spring.

CLUTCH CONTROL ACTUATOR

Drive of clutch switching off hydraulic with pneumatic booster. It's shown at the fig. 9.

Free wheeling of clutch pedal is 5-7 mm. It's regulated with bolt 5.

In the operational process readjustment of free wheeling is allowed. Readjustment is carried out with changes of rod 7 length and unscrewing of lock-nut 6.

For clutch switching off provision It's necessary to regulate full pedal stroke providing capacity of rod of pneumatic-hydraulic booster (B=25,0-28,0 mm). This operation is carried out with the bolts 4 and 5.

After replacement of pneumatic-hydraulic booster 10 it's necessary to provide dimension between piston and butt-end of the cylinder of pneumatic-hydraulic booster no less than 32 mm.

Before the pneumatic-hydraulic booster installation it's necessary to check position of the clutch fork. The clutch fork must lean on spherical support 8 (it's situated behind gear box at the opposite side from pneumatic-hydraulic booster) as fig. 9 shows, and be in contact with area of bearing. At the same time release clutch must go into throat of clutch fork and hold out from turning by clutch fork.

At the process of infill of clutch hydraulic circuit system it's necessary to pump working fluid in the system of hydraulic circuit under overpressure 200–300 kPa. It's operated through preliminary unscrewed on 1-2 turn of valve 11 until full disappearance of air-bladders in liquid coming out into canister 3. It's allowed to infill system through the canister 3 under the pressure 200–300 kPa and unscrewed on 1–2 turn of valve. This operation must be carried out as long as water coming out the valve becomes clear without air-bladders. The valve must be tightened and covered with protective shroud after filling up of the system. Level of liquid must be brought till 10–25 mm below filler neck.

GEARBOX

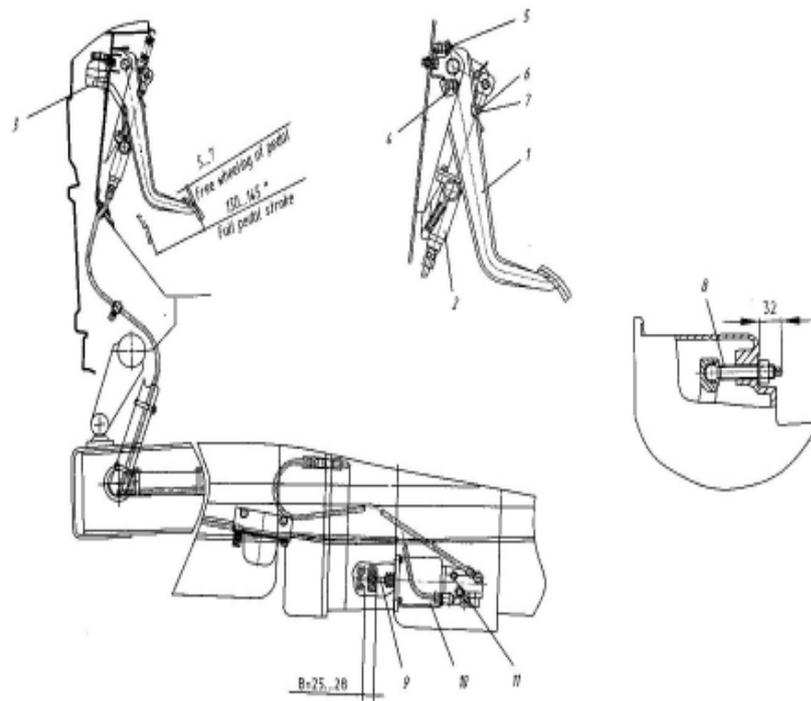
The gears are shifted by means of the lever of the remote control mechanism (Fig. 10)

If necessary, it should be adjusted during the operation.

The adjustment of the gearshift control shall be performed when the engine is not running.

The sequence of adjustment of the lever 1 position in the longitudinal and cross direction is as follows:

- lock the lever 8 in the neutral position by means of the screw 10;



* — reference dimension.

Fig. 9. Clutch control:

1 – pedal, 2 – hydro cylinder, 3 – canister, 4, 5 – regulated bolts, 6 – nut, 7, 9 – rod, 8 – support, 10 – pneumatic-hydraulic booster, 11 – valve.

- loosen the bolts 3 and set the angle α to be $80 \pm 2^\circ$ by shifting longitudinally the plate 4;
- when the plate travel distance is not sufficient, loosen the bolts 6, shift the rod 5 relatively to the tail 7, tighten the bolts 6 and repeat the adjustment of the angle « α » by shifting the plate 4.
- adjust the angle β to $90^\circ \pm 2^\circ$ by changing the length of the rod 11;
- the adjustment of the interlocking device of the telescopic connection of the rod shall be performed with the tilted cab as follows:
 - uncotter the pin 18 and disconnect the rod 5 from the fork 17;
 - loosen the locknut 20 and turn out the tail 19 against the stop of the thread;
 - push the internal rod 5 until the shackle lugs rest against the slots of the end 14;
 - while holding the mechanism in compressed state, turn in the tail 19 until the bush 15 interlocks the mechanism under the action of the spring 22;
 - tighten the locknut 20 and check the interlock mechanism for trouble-free functioning;

When the mechanism is blocked, both axial and angular plays shall be minimal. While in unlocked position (bush 15 is shifted to the right) the inner rod shall be pushed by the return spring by 35-50 mm. Further extension shifting shall be smooth without seizing and the blocking mechanism shall provide reliable fixing of the rod extension in initial position.

Do not allow bending and curving of the extensions and external rod.

While connecting the rod 5 to the fork 17 the hole in the shackle under the pin 18 shall be located under the longitudinal axis of the rod 5.

To the driver's attention! When it is necessary to start the engine with the cab tilted make sure that the lever 6 is in the neutral position (the roller of the lever 6, while feeling the spring is being compressed, is to move under depressing it by hand in axial direction by 30-35 mm).

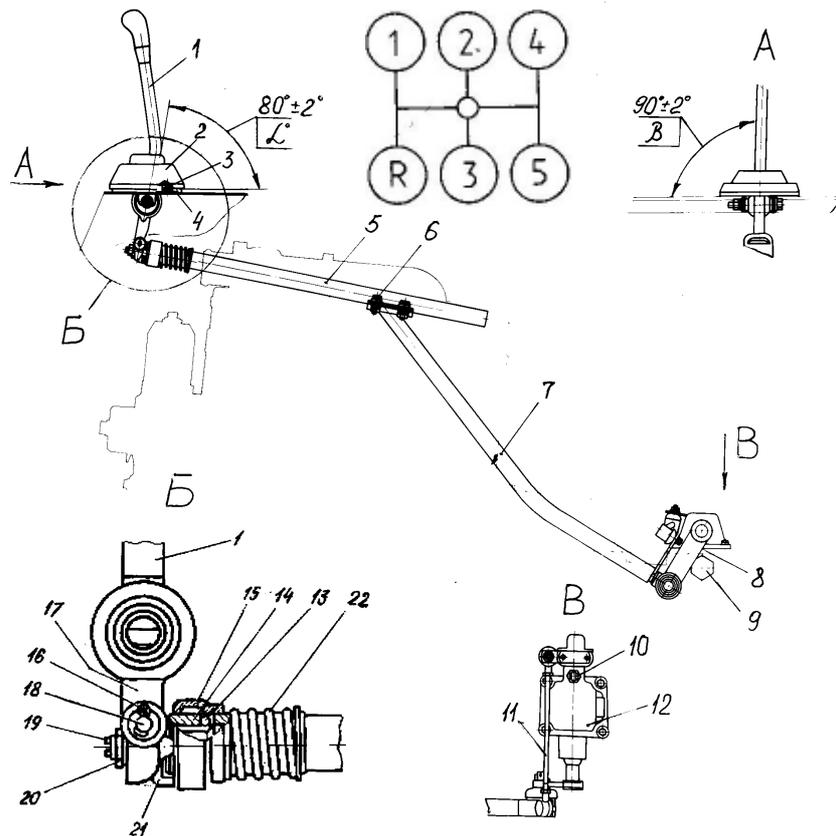


Fig. 10. Gearbox control drive

1 - lever; 2 - sealing jacket; 3 and 6 - bolt; 4 - plate; 5, 7 and 11 - rods; 8 - lever; 9 - fixing arm; 10 - screw; 12 - gear shifting mechanism; 13 - ball; 14 - rod end; 15 - locking bush; 16 - cotter pin; 17 - fork; 18 - pin; 19 - tail; 20 - nut; 21 - shackle; 22 - spring.

ADJUSTING SERVICE BRAKE

The angle $\alpha 45^\circ + 2^\circ$ is adjusted by the bolt 2 (Fig. 11). After adjustment, tighten the nut 3 by the moment 11.8 - 15.7 Nm. The pedal free travel shall be 17 - 27 mm. The adjustment shall be performed by changing the length of the stem 4. After adjustment, tighten the nut 5 by the moment 23.5 - 35.3 Nm.

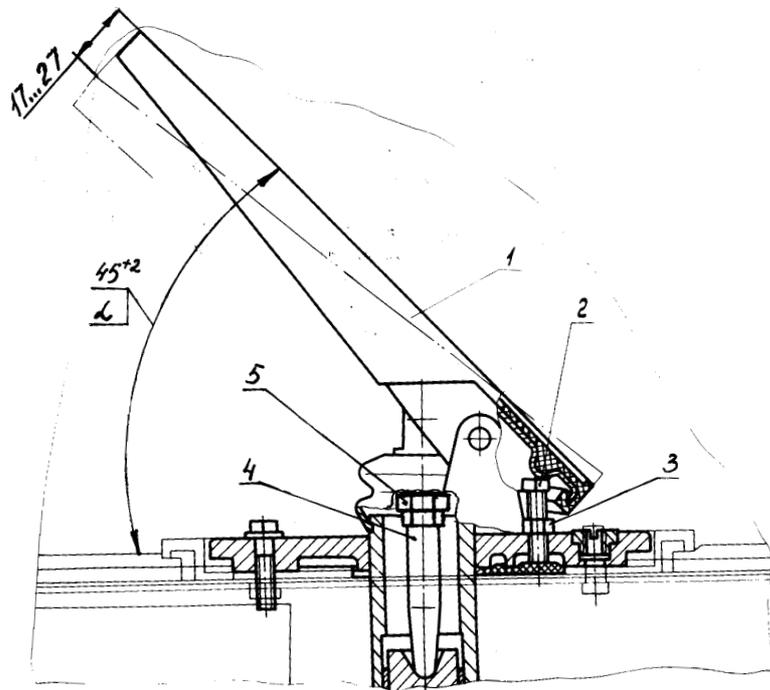


Fig. 11. Brake valve drive

1 - pedal; 2 - bolt; 3 and 5 - nut; 4 - stem.

The truck is equipped with adjusting levers (Fig. 12) with automatic adjustment of the gap between the shoe lining and brake drum. Therefore, no adjustment of the gap between them is performed during the operation. The stroke of rods of the brake chambers shall be within the range 28 to 34 mm.

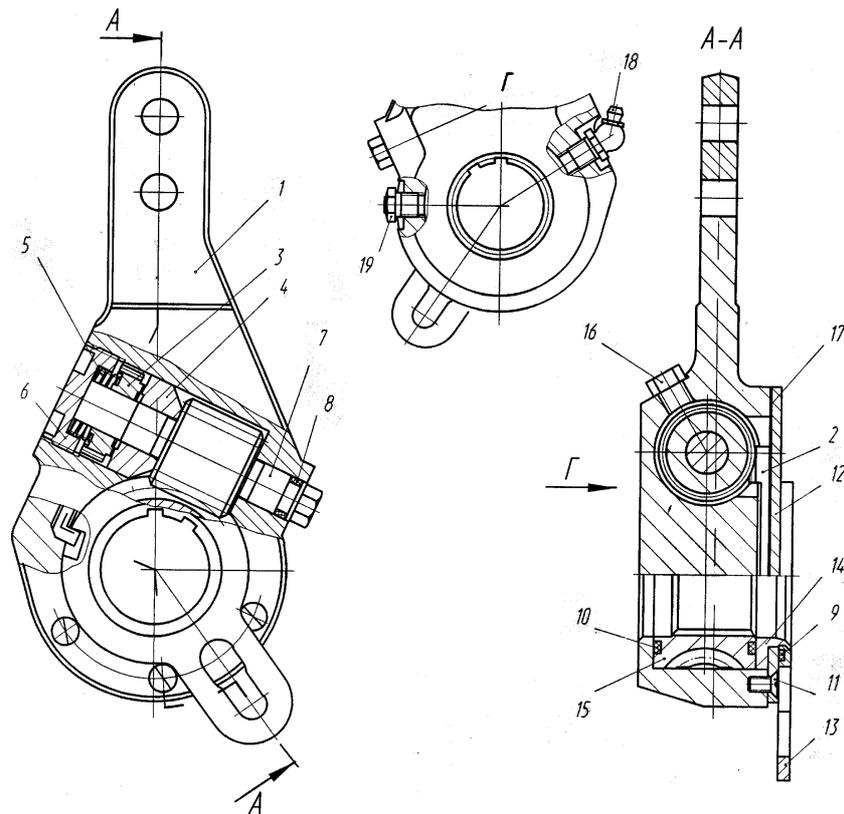


Fig. 12. Automatic adjusting lever:

1 - casing; 2 - pusher; 3 - movable half-coupling; 4 - stationary half-coupling; 5 - spring; 6 - pug; 7 - worm shaft; 8, 9 and 10 - O-rings; 11 - screw; 12 - cover; 13 - carrier; 14 - control ring; 15 - pinion; 16 - plug; 17 - gasket; 18 - pressure lubricator; 19 - safety valve.

The symptom of irregular operation of the lever with the automatic gap control is increased stroke as well as turning of the worm 7 (Fig. 12) in both direction (in case of regular operation - in only one direction).

To replace the lever, proceed as follows:

- turn out the plug 16 from the casing;
- press the half-coupling 3 out using a thin screwdriver and put the shoes together while rotating by the head of the shaft 7; loosen the latch bolt;
- remove the adjusting lever from the releasing cam having disconnected it previously from the brake chamber;
- set the adjusting lever onto the releasing cam shaft in such a way that the distance from the brake chamber fork to the lever 20-80 mm. In this case, the lever shall be positioned with the plug 6 directed forward along the travel of the brake chamber rod when braking and with the hexahedral end of the worm shaft 7 - towards the brake chamber;
- align the chamber rod fork holes with the lever by rotating the hexahedral end of the worm shaft counter-clockwise, when doing this, the clicks of the reverse clutch shall be felt; and connect the lever with the fork by means of a finger. When it will be done, the release cam shaft will remain in the initial position under the action of the tension spring of the shoes;
- turn the lever carrier 13 as far as it will go (in the direction of the lever rotation during the braking) and fix it in this position;
- adjust the stroke of the brake chamber rod by stepping consequently the brake pedal as far as it will go at the compressed air pressure in the system of at least 600 kPa (6 kgf/cm²) until the constant rod travel is constant within the range (28-34) mm.

The maintenance of the adjusting lever (Fig. 12) consists in changing the lubricant in the internal cavities with cleaning and washing the parts.

To do this, it shall be disassembled* in the following sequence:

- turn out the plug 6 after unlocking it;
- remove the spring 5 with the half-coupling 3;
- remove the cover 12 with the carrier 13 and control ring assembly 14 and gasket 17, pusher 2;
- remove the worm 7 with half-coupling 4 assembled;
- remove the pinion 15.

*When mounting the adjusting lever with the pressure lubricator 18 (Fig. 12), the lubricator shall be performed through the pressure lubricator without disassembling the lever.

To reassemble the lever, proceed as follows. Screw the plug 6 as far as it will go with applying the torque of 2-3 N (0.2-0.3 kgf-m) and turn it out by 15-20° (after lubricating the thread with liquid gasket LOCTITE 5900 or SILICONE-101U. Fix the plug by bending the shoulder into the casing slot.

It is not allowed to use any lubricants except for those specified in the Lubrication Chart.

HEADLIGHTS AIMING

To be performed using special equipment.

MAINTENANCE OF THE TRUCK

Regular and thorough maintenance of the truck is the best way for cutting down the operation costs concerning the truck and ensuring trouble-free operation and long service life.

Within the service period of the MAZ trucks, it is recommended to perform the following types of maintenance:

- daily maintenance;
- every 5,000 km maintenance (A);
- every 20,000-km maintenance (C).

Prior to carrying out the next scheduled maintenance work, wash and clean the truck from dirt.

When performing the maintenance, provide the conditions excluding the ingress of dust and dirt into the units and mechanisms.

It is recommended that the maintenance operations associated with adjustments and servicing of the fuel feed system apparatuses, electrical equipment and units of the hydraulic systems be carried out at a service station where skilled specialists with the aid of required tools, instruments and test stands will perform these operations promptly and with high degree of quality.

Having removed the apparatus of the fuel feed system and disconnected the fuel pipelines, do not fail to protect the unions of the fuel injection pump, fuel transfer pump, fuel injectors, filters and holes of the fuel pipelines against ingress of dirt by means of plugs, caps, blank covers or clean insulating tape.

Maintenance Schedule

Daily Maintenance

Item No.	Work content	Specifications
1	2	3

Control inspection prior to departure

- | | | |
|----|---|---|
| 1 | Inspect the truck and check if there are any leakages of fuel, coolant and/or oil from the engine, gearbox, axle or steering gear. Check the air-tightness of the pneumatic brake actuators by ear. Check the presence of fuel in the tank. | No leakage of fluids, oil and fuel are allowed. Eliminate the trouble, if any. |
| 2. | <p>Prior to starting the engine, check the following:</p> <ul style="list-style-type: none"> - oil level in the engine crankcase and, if necessary, replenish the oil - coolant level in the extension tank and, if necessary, replenish the coolant. | <p>After stopping the engine following its run for 5 minutes, the oil level shall be at the upper mark of the dipstick.</p> <p>The level shall be at the lower edge of filler neck branch pipe.</p> |
| 3. | Check the operation of the engine at various rotational speeds. Check and, if necessary, adjust the fuel supply control. | Start the engine and warm it up to the coolant temperature 40...50°C. Make sure that there are no hammering not typical for the normal running of the engine. |
| 4. | Check the oil pressure. | The oil pressure at 550...650 min ⁻¹ shall be 1 kg/cm ² ; at 2,080...2,150 min ⁻¹ — 4.6 kg/cm ² . |
| 5. | When driving the movement, check the operation of the clutch, gearshift control and steering. | <p>The clutch disengagement shall be smooth and complete.</p> <p>The gears shall be changed accurately and without noise.</p> <p>The truck shall be driven easily; there shall be no jerks on the steering wheel.</p> |

1	2	3
---	---	---

- | | | |
|-----|---|--|
| 6. | Fill the tank with water and check the operation of the windshield washer. | |
| 7. | Check the air pressure in tires. | Rated pressure according to the instruction. |
| 8. | Inspect the wheels fixing (including spare wheel) and the condition of tires. | Presence of all the nuts, wheels studs; absence of their damages and the damages of tires. |
| 9. | Check the good condition and operation of lighting devices, audible and lighting signaling, control measuring devices, windshield wipers, as well as good condition of lamps in the control lamps unit. | With the engine running, make sure that the instruments are in the good condition and their readings are accurate by operating them in sequence. |
| 10. | Check the operation of the brake system including the parking brake. | When stepping smoothly the brake pedal during the movement, the braking shall increase smoothly, without jerks and jolts. |

Daily maintenance

(to be performed on the return of the truck)

- | | | |
|-----|--|---|
| 11. | Clean and wash. | When washing with the hose, avoid the direction of the jet to electrical devices. |
| 12. | Inspect the truck, reveal the external damages. | The truck shall have no external damages. |
| 13. | Check the presence of condensate in the air cylinders. | Should any condensate be present, replace the cartridge in the dehumidifier. |

Control inspection on the way

- | | | |
|-----|---|--|
| 14. | Check the degree of heating of the wheel hubs, brake drums, driving axle housings and hubs. | Check the heat immediately after the truck stop. The heat is considered to be normal if it does not cause the feeling of burn of the palm. |
|-----|---|--|

1	2	3
15.	Inspect the truck from the outside and make sure that there is no leakage of oil, fuel and coolant from the engine and its systems, driving axle, shock absorbers and steering gear.	The leakage of liquid is not allowed.
16.	Perform the maintenance of the storage batteries at least once two weeks: - cleans them from dust and dirt; - remove the electrolyte spilled onto the surface - check and clean out the ventilation holes in the plugs of the components - check the reliability of fastening the storage batteries and tightness of the contact of the wire lugs with the leads batteries; - check the electrolyte level in all cells of the batteries and, if necessary, replenish the electrolyte. - check the integrity of the monoblock	The storage batteries shall be clean, in good order and have no leakages and the wire lugs and leads shall be greased. The holes in the plugs shall not be clogged. Loosen the bolts tighten the nuts The electrolyte level shall be 15-20 mm above the protective shields There shall be no cracks
First Maintenance (A)		
1.	Perform all the works provided for the daily maintenance.	
2.	Check the tightening of the engine driving belts and, if necessary, adjust them.	See the engine operation instruction.
3.	Check the condition of the engine air supply system connections. If necessary, tighten the yokes connections.	No loosening of the fastenings is allowed. The rubber pipe connections shall have no damage.
4.	Check the splinting of the nuts of the steering rods balls pins, bolts fastening the levers to steering knuckle, brake chambers fork pins and, if necessary, eliminate the troubles.	Nuts and pins shall be splinted. There shall be neither breaks nor incurvatures.
5.	Check and, if necessary, tighten the nuts fastening the wheels to the hubs, check the condition of rims.	The nuts shall be securely tightened. The rims shall be free of deformations.
6.	Check the condition of the cab tilting mechanism fixing as well as the safety ropes.	Tighten the loosened nuts. No breaks of the rope wires are allowed.

1	2	3
7.	Check the condition of the spare wheel and, if necessary, tighten the wheel fixing nuts and bracket fixing to the frame.	Nuts shall be tightened.
8	Check and, if necessary, tighten the nuts of clamps of the track-rod ends	
9	Check the degree of charge of the storage batteries.	Remove and charge the storage batteries, if necessary
10	Check the free travel of the clutch pedal and, if necessary, adjust it.	The free travel shall be 5-7 mm
11	Check and, if necessary, tighten the nuts fastening the truck platform to the frame, adjust the locks of the gate and sides of the platform to ensure the tight abutment of the gate locks to the pivots of the posts. Tighten the lock nuts with applying the torque of 55-59 Nm (5.5-8 kgf-m)	
12	Check and, if necessary, tighten the nuts fastening the frame cross-members, which have bolted connections, as well as the nuts of the rear protective bar.	The nuts shall be tightened with the torque of 120...160 Nm.
14	Check and, if necessary, tighten the nuts fastening the gimbal gear flange, intermediate support and covers of the spider bearings.	Tightening torque of the flange nuts and intermediate support ones shall be 160...200 Nm, and that of the covers shall be 13,7...17,6 Nm.
15	Lubricate the truck components.	In accordance with the Lubrication Chart.
16	Check the play in the steering connection. If necessary, eliminate the play.	When rocking the steering wheel (when the engine is running), no knocking in the steering connections is allowed.
17	Check the balancing and, if necessary, perform it.	

1	2	3
18	After the maintenance, check the operation of units, mechanisms and devices.	To be performed by the control run at the beginning of the movement using the method of switching on consequently and checking the correct functioning of units and devices. The force on the steering wheel rim when turning to any side shall vary without jerks or jamming. When pressing smoothly the brake pedal, the braking shall increase smoothly without jerks and provide the fast stop of the truck with simultaneous braking of all the wheels.

Every second maintenance A(B):

- | | | |
|----|--|--|
| 19 | Carry out the maintenance of the air filter. | |
| 20 | Replace the components of fine and coarse filters and wash the housing. | After installing a new element, tighten carefully the filter fastening bolts. |
| 21 | Check and, if necessary, tighten the bolt connections of the air path. | The connections shall be tightened. |
| 22 | Check and, if necessary, tighten the bolt connections of the tubes of the engine exhaust gases outlet system, muffler fixing and condition of parts of the system. | All the connections shall be tightened. No leakage of gases, burnout, breaks and cracks of system parts are allowed. |
| 23 | Check the fastening of the brackets of the energy accumulators. | The connection shall be tightened with applying the torque of 160-220 Nm. |

Second Maintenance (C)

- | | |
|---|---|
| 1 | Carry out all the works connected with maintenance (A) and (B). |
| 2 | Check and, if necessary, tighten the engine supports fixing |

1	2	3
3	Check the play in the gimbal gear spline connection.	Carry out the check with the engaged gear and released parking brake. No considerable rotational play is allowed.
4	In case of increased free travel of the steering wheel and absence of the play in the steering connections, disassemble the steering gear and perform the adjustment	
5	Check the play of the bearings of the front and rear wheels and, if necessary, adjust the tightness of the bearings.	When shaking the hanged out wheel, there shall be no play in bearings.
6	Check the frame condition.	The frame parts shall have neither cracks or breaks, nor loosening of the riveted joints.
7	Check the integrity of the spring center bolts and tightening of the U-bolt nuts, bolts fastening the springs and nuts fastening the shock absorbers.	There shall be neither longitudinal nor transversal shift of spring leaves.
8	Check and, if necessary, tighten the fasteners of the fuel tank brackets and yokes and pneumatic brake system receivers.	
9	Check the serviceability and operation of the lighting devices, audible and lighting signaling, monitoring instruments, wind-screen wipers, and serviceability of lamps in the control lamps unit.	With the engine running, make sure that the instruments are serviceable and their readings are accurate by operating them sequentially.
10	Check the condition of the rubber jackets and hoses on the socket connector and terminal connections.	Jackets shall be closely inserted one into another and have no damage.
11	Check the free travel of the steering wheel and, if necessary, adjust it.	The free travel of the steering wheel shall not exceed 18°

1	2	3
12	Check the thickness of brake linings with the brake drums removed and, if necessary, replace the linings.	The thickness of linings shall be not less than 6 mm, replace the lining when the distance from the lining surface to the control bead or the rivet is 1 mm.
13	Carry out the maintenance of power plant in accordance with the recommendations of the operating and maintenance instructions.	
14	Carry out the lubrication of the truck in accordance with the Lubrication Chart.	
15	Check the operation of units, mechanisms and devices after the maintenance.	To be performed by the control run at the beginning of the movement using the method of switching on consequently and checking the correct functioning of units and devices. The force on the steering wheel rim when turning to any side shall vary without jerks or jamming. When pressing smoothly the brake pedal, the braking shall increase smoothly without jerks and provide the fast stop of the truck with simultaneous braking of all the wheels.

Seasonal Maintenance:

It is recommended to prepare the truck for the operation in winter or summer period together with the regular maintenance C and to perform additionally the following works:

1	2	3
---	---	---

1. Perform all the works within the scope of the maintenance (C).
2. Check the condition of the thrust bearings and tightening of the pins nuts.
3. In autumn and spring, change the fuel and oil according to the season.
4. Once a year drain the oil from the hydraulic booster system, perform the oil sedimentation and filtration. Wash the filter, oil tank and fill in the filtered oil.
5. Check the thickness of the brake-shoe linings The check shall be performed with the brake drums removed (for the linings thickness see item 12 of the Maintenance C

LUBRICATION OF THE TRUCK

Lubricate the truck units and assemblies in accordance with the Lubrication Chart specifying the oil and lubricant sorts, lubricating intervals and quantity of lubrication points.

Lubricate the engine units and assemblies in accordance with its Operation Manuals.

The lubrication interval depends on the specific conditions of operation and oil sorts used.

The truck run between the maintenances is given in the section «Maintenance».

Do not use lubricants other than those specified in the Lubrication Chart.

The designations used in the Lubrication and Fuel Chart are as follows:

- DM - daily maintenance.
- A - maintenance after 5,000 km of run;
- B - maintenance after 10,000 km of run;
- C - maintenance after 20,000 km of run;
- D - maintenance after 30,000 km of run.

STORAGE OF THE TRUCK

LUBRICATION

Lubrication (filling) point	Number of lubrication (filling) points	Basic grade, Application season	Foreign analogues (brand, specification, company)
<p>Engine feed system</p> <p>Ì Ì Ç Ä-245. 30E2 Euro-2</p>	<p>1 tank</p>	<p>Diesel fuel containing not more than 0.5% of sulphur according to the season, either summer or winter</p> <p>In summer: Grades: È-40, È-62 (at the ambient temperature of down to 0°C)</p> <p>In winter: Grades: 3 minus 35°C (at the ambient temperature of down to minus 20°C) Grades: 3 minus 45°C (at the ambient temperature of down to minus 30°C) Grades: A (at the temperature of down to minus 50°C)</p>	<p>Diesel fuel containing not more than 0.5% of sulphur according to the season, either summer or winter, according to the European norm</p> <p>EN 590 ISO 8217 or norms of norms of other countries BS 269 Class A1 and A2 (Great Britain) DIN EN 590 (Germany) ONORM EN 590 (Austria) ASTM D 975 N01D and 2D (USA) According to DIN EN 590 (Germany), the following fuel shall be used:</p> <p>In summer: Summer-grade diesel down to 0°C (at the ambient temperature of down to 0°C)</p> <p>In winter: Winter-grade diesel down to -20°C (at the ambient temperature of down to 20°C) Winter-grade diesel down to -22°C (at the ambient temperature of down to 22°C) Special diesel fuel (Alpine or Arctic grade) (at the temperature of down to 50°C)</p>
<p>Engine cooling system</p> <p>Ì Ì Ç Ä-245. 30E2 Euro-2</p>	<p>1</p>	<p>At the ambient temperature of down to minus 40°C. «Tosol-A-40M» coolant</p> <p>At the ambient temperature of down to minus 40°C. «Tosol-A-65M» coolant</p>	<p>AL-3 Sort S-735 (England) MIL-E-5559 (BS 3150) (USA)</p>

CHART

Amount of lubricant		Lubricant and fuel change (adding) interval	Lubrication (oil filling, change) instructions Rate of drain (collection) of used oil.
filling rating	total for a truck		
130 1	130 1		
21.9 1	21.9 1	EO	Add to the normal level. In case of evaporation - add clean water; in case of leakages add the coolant of appropriate grade. Change the coolant once a year

Lubrication (filling) point	Number of lubrication (filling) points	Basic grade, Application season	Foreign analogues (brand, specification, company)
Engine lubrication system	1 tank	In summer: M-10Ä2 engine oil GOST 8581-78 In winter: MÄ-8Ä2 engine oil GOST 8581-78 For all seasons: M-4 ₃ /8Ä ₂	Engine oils SAE viscosity class In summer: SAE 30 (up to plus 30°C) SAE 40/50 (above plus 35°C) In winter: SAE10W SAE 20W For all seasons: 5W-30 (down to 30°C) 5W-40 (down to 30°C) 10W-30 (down to 20°C) 10W-40 (down to 20°C) 15W-40 (down to 15°C) 20W-20 (down to 10°C) According to the European classification ACEA E2-96/E3-96 According to the American classification API CD/CE/ CF-4/CG-4/CH-4 MIL-L-2104C/D (NATO) For all seasons: SA 10W-20 Shell: Rotella TX20W-20, SX 20W-20 In winter: SAE 20W In summer: SAE 30, 40 Shell: Rotella TX30 Mobil: Delvac 1200/1220
Fuel pump	1		
Fuel supply control rope	1	Grease Litol-24	DIN 51502 (Germany) MIL-G-10924 (USA) C.S.3107B grade XG-279 (England) Shell: Retinax EP2; Mobil: Mobilgrease MP, Mobilux EP2/EP3 BP: Energrease LS-EP2 Texaco: Multifak EP2 Esso: Beacon EP2

Amount of lubricant		Lubricant and fuel change (adding) interval	Lubrication (oil filling, change) instructions Rate of drain (collection) of used oil.
filling rating	total for a truck		
14.8	14.8 l	EO A	Change the oil after running-in Check the oil level and add the oil if necessary Change the oil in the lubrication system Rate of drain: 13.5 l * In case of the filter replacement, the oil volume shall be increased by 1.5 l
0.19 l	0.19 l		Pour oil in case of installation of a new or repaired pump * In case of the filter replacement, the oil volume shall be increased by 1.5 l
0.03 kg	0.03 kg	2C	Disassembly the unit, wash the rope and lubricate it with a thin layer of the grease.

Lubrication (filling) point	Number of lubrication (filling) points	Basic grade, Application season	Foreign analogues (brand, specification, company)
G e a r b o x housing	1 tank	<p>For all seasons: Ñi -15K transmission oil (at the ambient temperature of down to minus 25°C)</p> <p>In winter: Ñi -10K transmission oil (at the ambient temperature of below minus 30°C)</p>	<p>Gear oils: SAE viscosity class: In summer: SAE 90 (from minus 12°C up to plus 38°C) In winter: SAE 80W (from minus 26°C up to plus 38°C)</p> <p>For all seasons: 75W-80 (from minus 40°C up to plus 30°C) 75W-90 (from minus 40°C up to plus 40°C) 80W-90 (from minus 26°C up to plus 30°C) 85W-90 (from minus 12°C up to plus 38°C)</p> <p>According to the American Classification API GL-3/3/4/5 MIL-L-2105</p> <p>According to the classification ZF TE-ML 02/05/07/12</p> <p>According to the norms MAN M3343 (API GL-4+5) M341 (API GL-4) M342 (API GL-5)</p> <p>According to the Repair Manual for SAAZ AMO ZIL: SHELL: Spirax EP 90 MOBIL: Mobilube GX90 BP: Gear Oil 90 EP</p>
Rear axle main gear housing	1	Hypoid gear oil Ñi -14ãi	<p>Gear oils from foreign manufacturers for hypoid gearings of the following quality class according to the API: GL-4/5, MIL-L-2105D (USA)</p> <p>SAE viscosity class: In summer: SAE90 In winter: SAE80W For all seasons: SAE 80W-90, 85W 90</p>

Amount of lubricant		Lubricant and fuel change (adding) interval	Lubrication (oil filling, change) instructions Rate of drain (collection) of used oil.
filling rating	total for a truck		
6.5 l	6.5 l	TO-1000 A 5C	Change the oil after running-in Check the oil level and add the oil if necessary Change the oil Rate of drain - 6 l
6.2 l	6.2 l	TO-1000 A 2C	Change oil after running-in. Check oil level and add oil if necessary Drain the used oil and add fresh oil up to the filler checking hole level. Rate of drain - 5.5 L

Lubrication (filling) point	Number of lubrication (filling) points	Basic grade, Application season	Foreign analogues (brand, specification, company)
Rear axle hubs	2	Grease Litol-24	DIN 51502 (Germany) MIL-G-10924C (USA) C.S.3107B Grade XG-279 (England), Shell Retinax EP2; Mobil: Mobilgrease MP Mobilux EP2/EP3
Front wheels hubs	2		BP: Energrease LS-EP2 Texaco: Multifak EP2 Esso: Beacon EP2
Bearings of the intermediate support of the gimbal gear	1		
Splines of the propeller shaft of the rear axle drive	1	Grease ÖÈÀÒÈÌ -201	
Needle bearings of the gimbal gear of the rear axle drive	3	Lubricant No. 158M	DIN 51502 (Germany) Shell: Retinax HDX2 (MoS2) Mobil: Mobilgrease Special (MoS2) BP: Energrease L21M (MoS2) Esso: Multi-purpose, Lithium
Clutch control supports	2	Grease Litol-24 GOST 21150-87	DIN 51502 (Germany) MIL-G-10924C (USA) C.S.3107B Grade XG-279 (England) Shell: Retinax EP2; Mobil: Mobilgrease MP Mobilflux EP2/EP3
Gearbox control	6		BP: Energrease LS-EP2 Texaco: Multifak EP2 Esso: Beacon EP2

Amount of lubricant		Lubricant and fuel change (adding) interval	Lubrication (oil filling, change) instructions Rate of drain (collection) of used oil.
filling rating	total for a truck		
0.400 kg	0.800 kg	2C	Put the grease in the bearings until the cavities between the rollers are filled completely. Lubricate the cover and inner cavity of the hub with a thin coat
0.125 kg	0.125 kg	À	Fill the inner cavity of the intermediate support with the grease through a pressure lubricator located on the interim support cover until the grease appears from the hole.
0.1 kg	0.1 kg	2A A	Lubricate until the grease appears from the hole in the sliding fork plug When operating the truck on dusty and dirty roads perform additionally the works specified above
0.020 kg	0.24 kg	C	Lubricate until the fresh grease appears from under the bearings facial seals
0.01 kg	0.02 kg		Put the grease into the bearings when performing the assembling and repairing works.
0.03 kg	0.18 kg		Lubricate the friction surfaces when performing the assembling and repairing works

Lubrication (filling) point	Number of lubrication (filling) points	Basic grade, Application season	Foreign analogues (brand, specification, company)
Clutch control	1	Brake fluid «ÐĬ ÑĀĬ Ò» «ÐĬ ÑĀĬ Ò4»	SAEJ1703, ISO4925 FMVSS 116 of the DOT3 and DOT4 (USA) Shell: DOnaB Esso: Attas Brake Fluid CD
Steering booster system	1	Oil for automobile hydraulic systems of the P grade (Ĭ Ā22-Ā)	MIL-H-5606D (USA) According to the classification ZF TE-ML 09 According to the «General Motors» classification of the AFT Dextron II/III According to the «Ford» classification: TF Mercon
Hydraulic jack	1	Hydraulic oil ĀĬ ĀÇ (Ĭ Ā15-Ā) or ĀĬ ĀÇ-C (Ĭ Ā15-Ā(c))	MIL-H-6083D (USA), DX-15 under DID-5540 (England). Shell: Tellus 21 Aeroshell Fluid 7 Esso Petroleum Co. Ltd.: Esso Univis j 43 Esso Univis 40 Mobil Oil: Mobil Fluid 93
Cab tilt system	1		

Amount of lubricant		Lubricant and fuel change (adding) interval	Lubrication (oil filling, change) instructions Rate of drain (collection) of used oil.
filling rating	total for a truck		
1.0 1	1.0 1	À	Check the fluid level and add, if necessary. Pour the fluid once a year
6.5 1	6.5 1	TO-1000 C 3Ñ	Change the oil after running-in Check the level and add the oil, if necessary. Change the oil.
0.2 1	0.2 1		Change the oil when performing the repair; fill in up to the level of filler opening.
0.78 1	0.78 1	2Ñ 4Ñ	Check the oil level and add the oil, if necessary; Change the oil. To do this: 1. Turn off the filler plug. 2. Disconnect the upper hose of the hydraulic cylinder from the fitting and tilt the cab at the full angle; when it will be done, the used oil will be drained from the disconnected hose. To tilt cab completely, add fresh filtered oil into the pump as necessary. 3. Connect the upper hose to the adaptor. 4. Disconnect the lower hose of the hydraulic cylinder from the fitting and lower the cab while adding fresh oil into the pump; when it will be done, the used oil will be drained from the disconnected hose. 5. Connect the lower hose to the fitting. 6. Bring the oil level up to the lower edge of the filler. 7. Screw in the filler plug

Lubrication (filling) point	Number of lubrication (filling) points	Basic grade, Application season	Foreign analogues (brand, specification, company)
Needle bearings of the cardan joint of the steering gear	2	Lubricant No. 158M	DIN 51502 (Germany) Shell: Retinax HDX2 (MoS2) Mobil: Mobilgrease Special (MoS2) BP: Energrease L21M (MoS2) Esso: Multi-purpose, Lithium
Transversal steering rod joints	2	Grease Litol-24	DIN 51502 (Germany) MIL-G-10924C (USA) C.S.3107B Grade XG-279 (England) Shell: Retinax EP2: Mobil: Mobilgrease MP Mobilflux EP2/EP3 BP: Energrease LS-EP2 Texaco: Multifak EP2 Esso: Beacon EP2
Longitudinal steering rod joints	2		
Steering column bearings and splines	1		
Splines of the steering column propeller shaft	1		
Rear support of the steering booster power cylinder	1		
Power cylinder joint of the steering booster	1		

Amount of lubricant		Lubricant and fuel change (adding) interval	Lubrication (oil filling, change) instructions Rate of drain (collection) of used oil.
filling rating	total for a truck		
0.008 kg	0.016 kg		Lubricate the grease when performing the assembly or repair of the cardan joint
0.05 kg	0.10 kg	2A	Perform the lubrication using a pressure lubricator until fresh grease appears from the gaps
0.05 kg	0.10 kg	2A	
0.02 kg	0.02 kg	2C	Perform the lubrication when performing the repair
0.02 kg	0.02 kg	2A	Lubricate the shaft splines with the cab tilted
0.02 kg	0.02 kg	2C	Perform the lubrication through the pressure lubricator until fresh grease appears from the gaps
0.05 kg	0.05 kg	2A	Perform the lubrication through the pressure lubricator until fresh grease appears from the gaps

Lubrication (filling) point	Number of lubrication (filling) points	Basic grade, Application season	Foreign analogues (brand, specification, company)
Worm pairs of adjusting levers of wheel brakes	4	Grease ÆÖ-72	DIN 51502 (Germany) Mobil Oil: Mobilgrease 24 Shell: Aeroshell 15 Aeroshell 15A
External surface and cavity of the brake valve drive tappet	1		
Bronze bushings of the brake shoes	8	Grease Litol-24	DIN 51502 (Germany) MIL-G-10924C (USA) C.S.3107B Grade XG-279 (England) Shell: Retinax EP2: Mobil: Mobilgrease MP Mobilflux EP2/EP3 BP: Energrease LS-EP2 Texaco: Multifak EP2 Esso: Beacon EP2
Bearings of releasing cams shafts of the driving axles	4		
Bushings of the releasing cams shafts (front)			
Bushings of rotating cams pintles or needle bearings	4		

Amount of lubricant		Lubricant and fuel change (adding) interval	Lubrication (oil filling, change) instructions Rate of drain (collection) of used oil.
filling rating	total for a truck		
0.02 kg	0.08 kg	2C	Remove the lever, disassembly it, clean and wash the parts and put fresh grease in the levers. If a pressure lubricator is available, perform the lubrication through it without disassembling the lever.
0.005 kg	0.005 kg	Ñ	Lubricate the surface with a thin coat of grease
0.01 kg	0.08 kg	CO	Lubricate the bushings when replacing the brake shoes and when performing the seasonal maintenance
0.015 kg	0.06 kg	C	Perform the lubrication through the pressure lubricator until fresh grease appears from the gaps
0.025 kg	0.05 kg	Ñ	Perform the lubrication through the pressure lubricator until fresh grease appears from the gaps
0.02 kg	0.08 kg	2A	Perform the lubrication through the pressure lubricator until fresh grease appears from the gaps

Lubrication (filling) point	Number of lubrication (filling) points	Basic grade, Application season	Foreign analogues (brand, specification, company)
Platform supports and guides	8	Grease Solidol C. Press-Solidol C	DIN 51502 (Germany) MIL-G-10924C (USA) Shell: Retinax C BP: Energrease C2, C3, GP2, GP3, PR2, PR3 Mobil: Mobilflux EP2
Leaves of the front and rear multiple springs	4	Graphite grease ÓÑñÀ	DIN 51502 (Germany) VV-G-671d (USA) Sort Grease 3 C.S.3113 Grade XG-264 (England) Shell: Barbatia 2/3 Mobil: Mobiltac 81 BP: Energrease C36/C2G/ GP2-G/ GP3-G Texaco: Clissando FMA-20 Esso: VanEstan2
Friction surfaces of the seat support lever axle	8		
Mechanism of seat back fixing and turning	2		
Seat longitudinal adjusting mechanism	4		
Internal surface of the bushing for the ABS sensor:	2		
- rear axle			
- front axle	2		

Amount of lubricant		Lubricant and fuel change (adding) interval	Lubrication (oil filling, change) instructions Rate of drain (collection) of used oil.
filling rating	total for a truck		
0.01 kg	0.08	À	Lubricate the surface with a thin coat of grease
0.25 kg	1.00 kg		Coat the leaves with a thin layer of the grease at the contact places when performing the repair
0.005 kg	0.04 kg		Lubricate the friction surfaces when performing the assembling and repairing works
0.005 kg	0.01 kg		Lubricate the friction surfaces when performing the assembling and repairing works
0.01 kg	0.04 kg		Lubricate the guides at the places of movement of the inserts when assembling the unit as well as if creak is heard
0.00025 kg	0.0005 kg		Lubricate the surface with a thin coat of the grease when replacing the brake shoes or in case the force to be applied for shifting the sensor over the bushing exceeds 120...140 N (12...14 kg)
0.00025 kg	0.0005 kg		

Lubrication (filling) point	Number of lubrication (filling) points	Basic grade, Application season	Foreign analogues (brand, specification, company)
Windshield washer tank	1	Mix of fluid «Obzor» with water in volumetric proportions: 1:9 - down to -5°C 1:5 - down to -10°C 1:2 - down to -20°C 1:1 - down to -30°C 2:1 - down to -40°C	

NOTES: It is allowed to use the grease Litol-24 instead of solidols of an grade..

Amount of lubricant		Lubricant and fuel change (adding) interval	Lubrication (oil filling, change) instructions Rate of drain (collection) of used oil.
filling rating	total for a truck		
2.01	2.01	—	The «Obzor» fluid mix shall be used when the ambient temperature is below +5°C

When storing the truck for more than three months, it is recommended to take it into a short-time operation, and after performing the servicing provided for the maintenance A, set the truck for the next storage period.

It is recommended to repeat this approach for putting into operation every three months of storage.

When the truck is to be stored for a long period, without taking it into a short-time operation, the following operations are to be performed:

- work provided for maintenance A;
 - place the truck on a roofed ground for the period of storage;
 - drain the fluid from the engine cooling system by opening the cocks on branch pipe supplying the coolant to the water pump, and on engine block on the right, from the preheater system, windshield washer and cab heating system;
 - fill the fuel tanks with 10 - 15 l of fuel;
- Seal up with adhesive tape the following units:
- engine oil filler cover;
 - engine breather tube hole;
 - hole for the oil dipstick;
 - draining taps of cooling system, heating system and preheater system;
 - filler neck of extension tank and opening of vapor-deviation tube;
 - fuel pump draining tube hole;
 - the slot between the housing and the cover of the air cleaner;
 - output hole of the exhaust pipe;
 - clutch housing cover;
 - breathers of the rear axle and the gearbox;
 - the holes communicating inner cavities with the atmosphere on the brake valve, pressure regulator, moisture separator;
 - taps for condensate draining from the receivers, control outlets and air intake valve;
 - openings on the alternator and the gap between the pulley and the alternator housing;
 - resonators of the horn;
 - joints of plug connectors of electrical equipment system.
- Coat the exposed terminals of electric equipment and exposed operation surfaces of the propeller shaft spline joint with protective grease.
- Carry out the operations provided in the section «Batteries storage».
- Put the truck onto supports for unloading the tires.

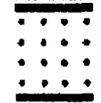
Appendix 1.

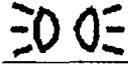
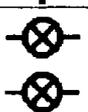
TIGHTENING TORQUE OF THE MAIN THREADED JOINTS Nm

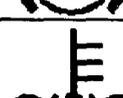
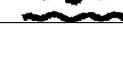
Appendix 2

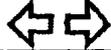
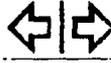
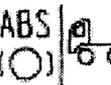
Name of the main threaded joints	Tightening torque Nm
Fixing of flanges of rear axle semi-axle and nuts of fixing of reducer to the housing	110... 160
Wheel fixing nuts	450...500
Nuts of studs of fixing of sleeve of axle driving conical gear	120...160
Nuts of front springs clips	180...200
Nuts of rear springs clips	280...320
Nuts of shock-absorber housings	98...118
Nuts of fixing of steering arm of steering wheel on sector shaft	392...432
Nuts of ball pins of steering drive	min. 275
Nuts of steering wheel fixing	196...275
Bolts of fixing of cover of bearing of rear axle drive gear	24...35

**SYMBOLS APPLIED TO THE ELECTRIC EQUIPMENT DEVICES
CONTENTS**

Symbol	Meaning of the symbol
	Air pressure control and failure of the front circuit of brake system
	Air pressure control and failure of the rear circuit of brake system
	Air filter clogging
	Road-train lights
	Emergency system warning flasher
	Battery discharge
	Headlights. Lower beam
	Windshield wiper
	Headlights. Upper beam
	Oil pressure in engine
	Electric torch
	Headlights wiper and washer
	Spotlight

Symbol	Meaning of the symbol
	Reverse movement lamp
	Side-lamps
	Steering hydraulic booster
	Headlights control
	Control lamps block
	Fuel level in the tank
	Monitoring instruments lighting
	Coolant level

Symbol	Meaning of the symbol
	Main light switch
	Windshield washer
	Inter-wheel differential blocking
	Rear fog light
	Windshield heating
	Engine stop control device
	Heater fan
	Devices
	Voltage indicator
	Service brake failure
	Temperature in the engine cooling system

Symbol	Meaning of the symbol
	Windshield wiper and washer
	Truck turn indicator
	Speed indicator
	Trailer (semi-trailer) turn indicator
	Cab full lighting
	Pneumatic horn
	Electric horn
	Ground remote switch
	Parking brake
	
	Stop lamps

INTRODUCTION	2
SAFETY REQUIREMENTS AND WARNINGS	3
TECHNICAL DATA	5
CONTROLS AND INSTRUMENTATION	7
CAB ACCESSORIES	12
PRE-SALE PREPARATION WORK LIST	14
RUNNING IN OF THE TRUCK	14
TRUCK OPERATION PECULIARITIES	15
PRE-OPERATION OF THE TRUCK	15
DRIVING THE TRUCK AND MONITORING ITS SYSTEMS	19
CAB TILTING	22
SECURING SPARE WHEEL	22
TIRES MOUNTING AND STRIPPING	23
ADJUSTMENTS	27
CLUTCH CONTROL ACTUATOR	28
GEARBOX	29
ADJUSTING SERVICE BRAKE	33
MAINTENANCE OF THE TRUCK	36
LUBRICATION OF THE TRUCK	44
LUBRICATION CHART	46
STORAGE OF THE TRUCK	64

