Ulyanovsk Automobile Plant, PJSC

Vehicles: UAZ-374195, UAZ-396295, UAZ-220695, UAZ-390995, UAZ-330365, UAZ-390945 and Versions Thereof

Operation Manual
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ATTENTION!

The manufacturer (UAZ PJSC) cares about its customers and hopes for thoughtful use of its products.

While supporting the all-Russian program of road transport accident reduction, the Manufacturer recommends that the maximum speed of 90 km/hr provided in the Traffic Rules for Public Roads not be exceeded.

Remember that a vehicle's control, stability and braking performance depend greatly on tires/traction, therefore select a driving speed according to traffic flow, weather and road conditions, pavement condition, and vehicle and cargo features. In any case, the driving speed must ensure the driver's continuous control over the vehicle to observe safety requirements and Traffic Rules.

The Operation Manual presents the necessary rules for operating and maintaining a motor vehicle.

Before getting started to operate a motor vehicle, please read carefully the Operation Manual and the vehicle log book.

Please pay special attention to the sections "Safety Requirements" and "Warnings" in the Operation Manual.

Improper operation can lead to injuries, motor vehicle and its assemblies malfunction of the motor vehicle and its parts, and termination of the warranty by the manufacturing plant.

For safe and fault-free motor vehicle operation, please observe operation and maintenance instructions specified in the Manual, and the log book.

Motor vehicle maintenance can be performed by one of the service stations recommended by the company that sold the motor vehicle. The service stations are equipped with the necessary spare parts, sets of special tools and equipment. All motor vehicle maintenance works are carried out by experienced specialists.

Vehicle's design is under continuous improvement; therefore, some data and illustrations herein can slightly differ from your actual vehicle; this is not a reason for any claims.

Have a great trip!

Chapter 1. GENERAL INFORMATION

UAZ-374195 motor vehicle (Fig. 1.1) is a cargo van with an all-metal wagon type closed body separated into a two-seat cab and a cargo compartment. It is designed for hauling cargo.

UAZ-374195-05 motor vehicle (Fig. 1.2) is a cargo vehicle with a wagon type body separated into a two-seat cab and a cargo / passenger compartment. It is designed for carrying both cargoes and passengers.

UAZ-396295 motor vehicle (Fig. 1.3), including versions of it, is a specialized medical passenger vehicle based on UAZ-3741 all-terrain chassis, with a wagon type body, separated into a two-seat change cab and a medical cab. It is designed for medical facilities needs.

UAZ-220695 motor vehicle (Fig. 1.4, 1.5), including its versions is a specialized passenger vehicle based on UAZ-3741 all-terrain chassis, with a wagon type body, separated into a two-seat cab and a passenger saloon. It is designed for passenger transportation.

UAZ-390995 motor vehicle (Fig. 1.6, 1.7) including its versions is a cargo vehicle with a wagon type body separated into a two-seat cab, a three- or five-seat passenger cab, and a cargo compartment. It is designed for both passenger and cargo transportation.

UAZ-330365 motor vehicle (Fig. 1.8) is a freight vehicle with an increased wheelbase, with a two-seat cab, and a metal or wooden cargo bed. It is designed for cargo transportation.

UAZ-330395 motor vehicle (Fig. 1.9) is a freight vehicle with a two-seat cab and a wooden cargo bed. It is designed for cargo transportation.

UAZ-390945 motor vehicle (Fig. 1.10) is a vehicle for public utility companies, cooperative and private farms. It has an increased wheelbase, a five-seat cab, and a metal cargo bed. It is designed for both passenger and cargo transportation.

UAZ all-terrain vehicles with front and rear driving axles are designed for operation on any road and terrain types.

The motor vehicles being manufactured in version "U" as per Category 1 of GOST 15150 are designed for operation under ambient operating temperatures between –40°C and +40°C, relative air humidity of up to 75 % at +15°C, air dust content of up to 1.0 g/m^3 and wind speed of up to 20 m/s including in regions located at absolute elevations of up to 3,000 m with corresponding reduction of traction dynamic performance and fuel efficiency.

Fig. 1.1. Overall dimensions (averaged) of UAZ-374195 motor vehicle with maximum gross weight (dimensions are given for reference)

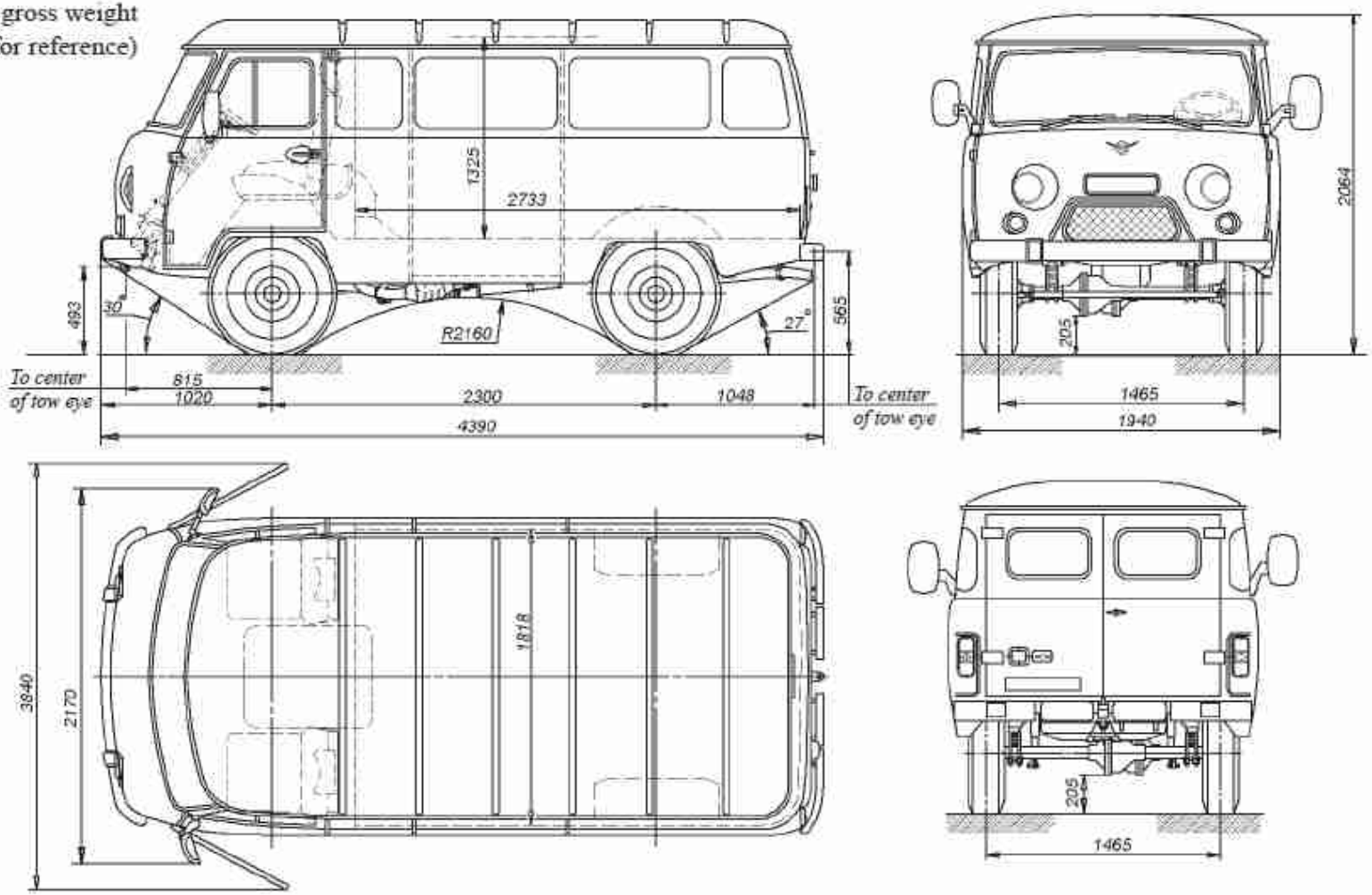


Fig. 1.2. Overall dimensions (averaged) of UAZ-374195-05 motor vehicle with maximum gross weight (dimensions are given for reference)

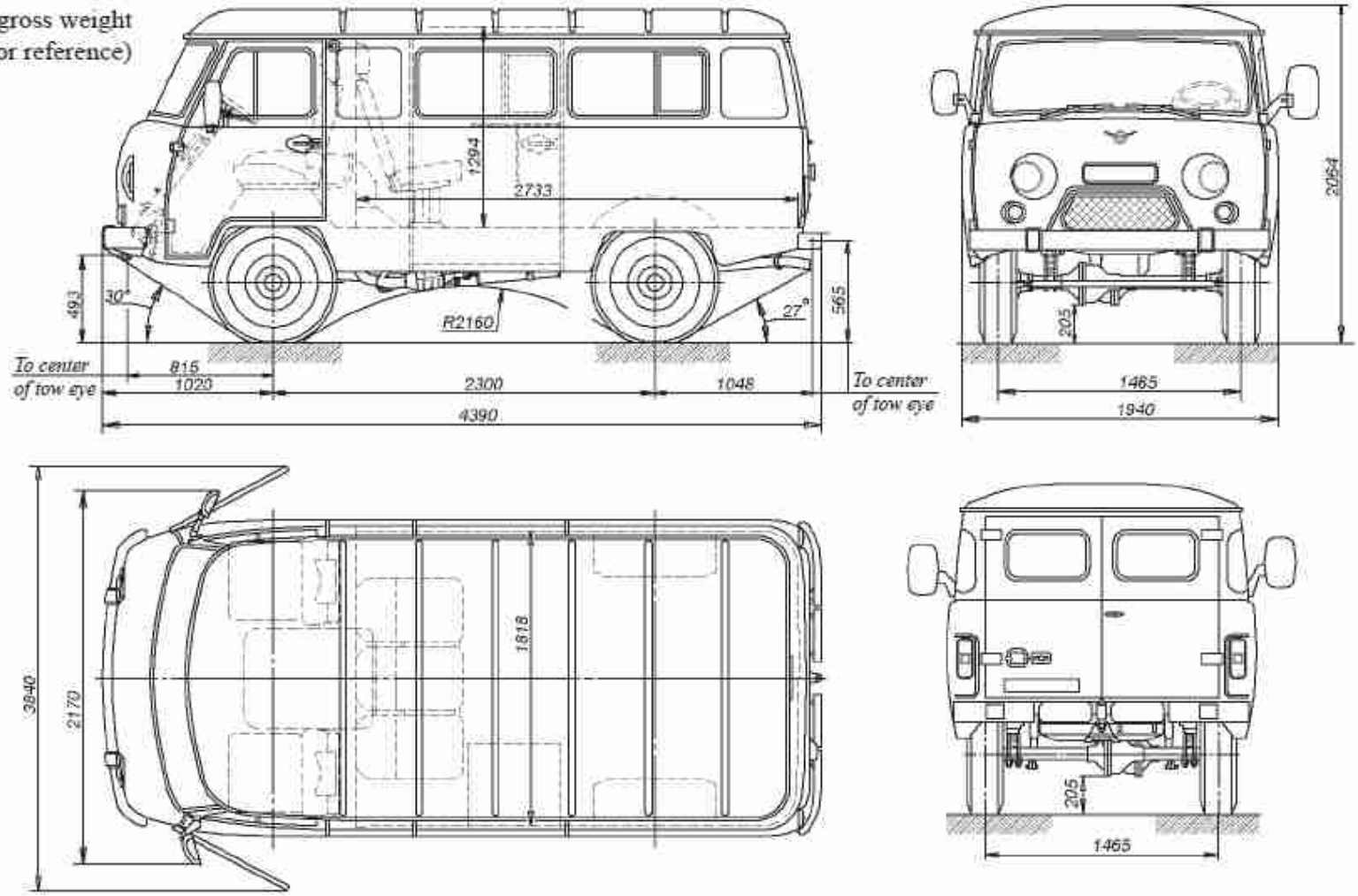


Fig. 1.3. Overall dimensions (averaged) of UAZ-396295 motor vehicle with maximum gross weight (dimensions are given for reference)

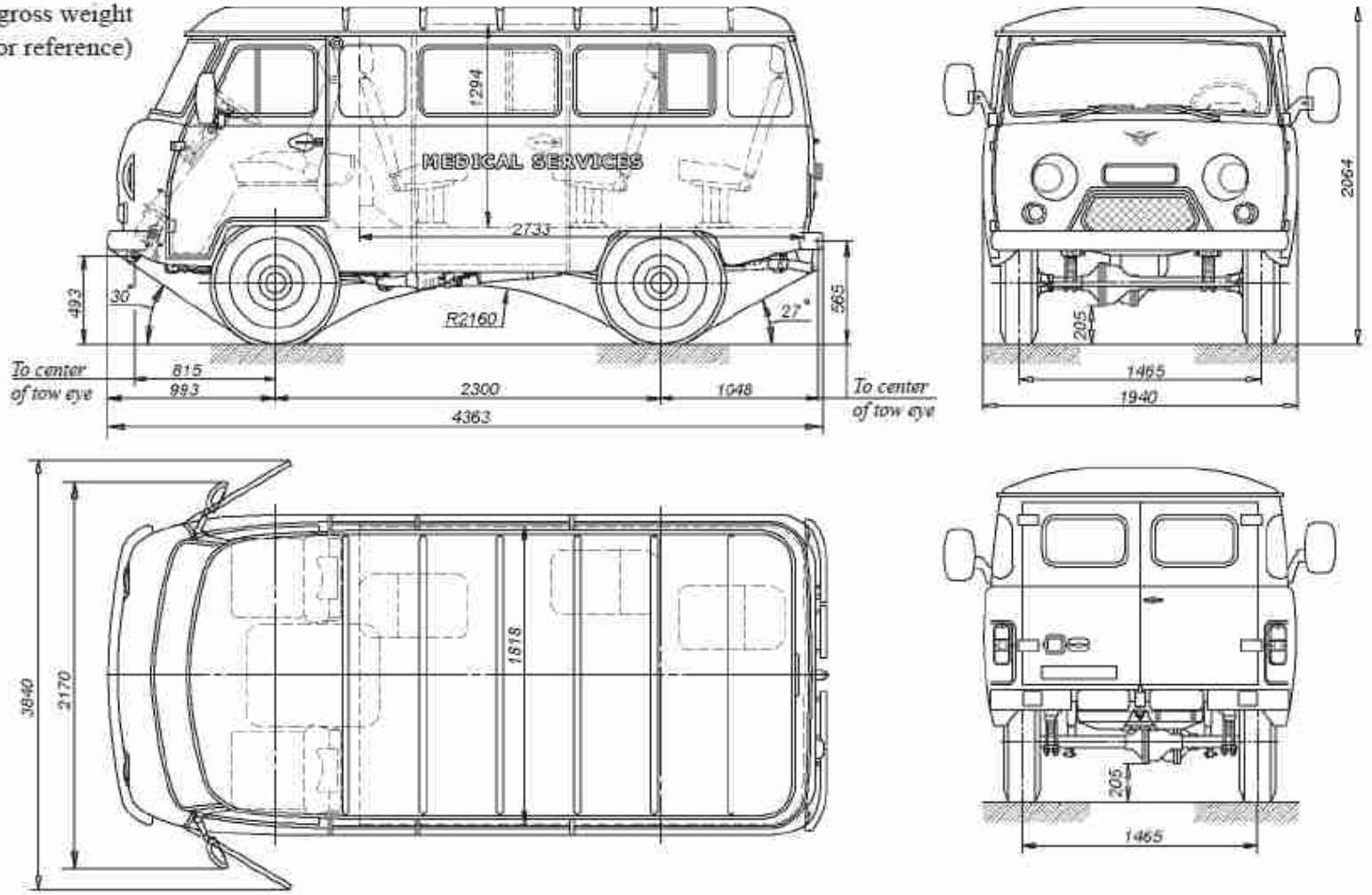


Fig. 1.4. Overall dimensions (averaged) of UAZ-220695 motor vehicle with maximum gross weight (dimensions are given for reference)

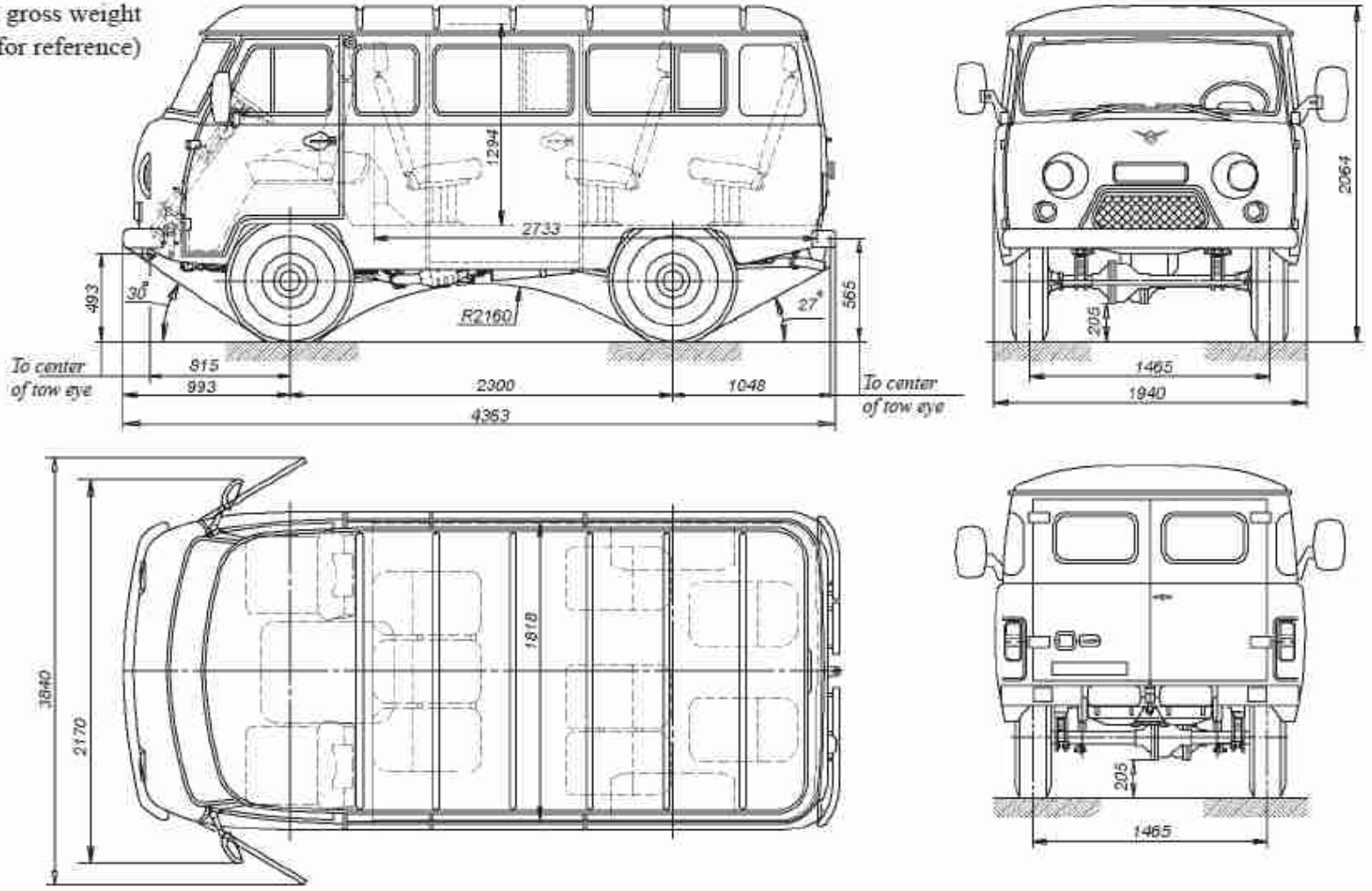


Fig. 1.5. Overall dimensions (averaged) of UAZ-220695-04 motor vehicle with maximum gross weight (dimensions are given for reference)

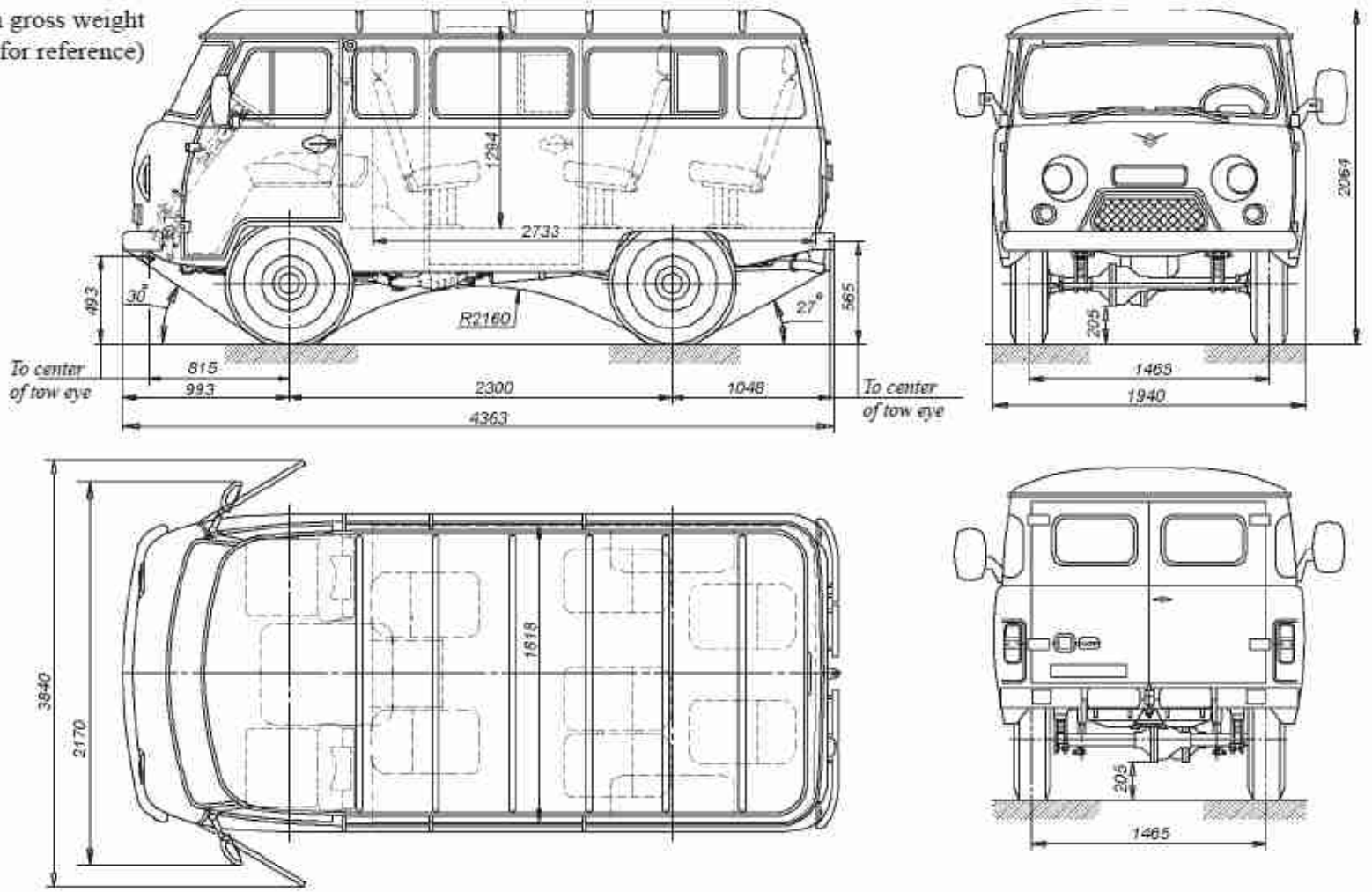


Fig. 1.6. Overall dimensions (averaged) of UAZ-390995 motor vehicle with maximum gross weight (dimensions are given for reference)

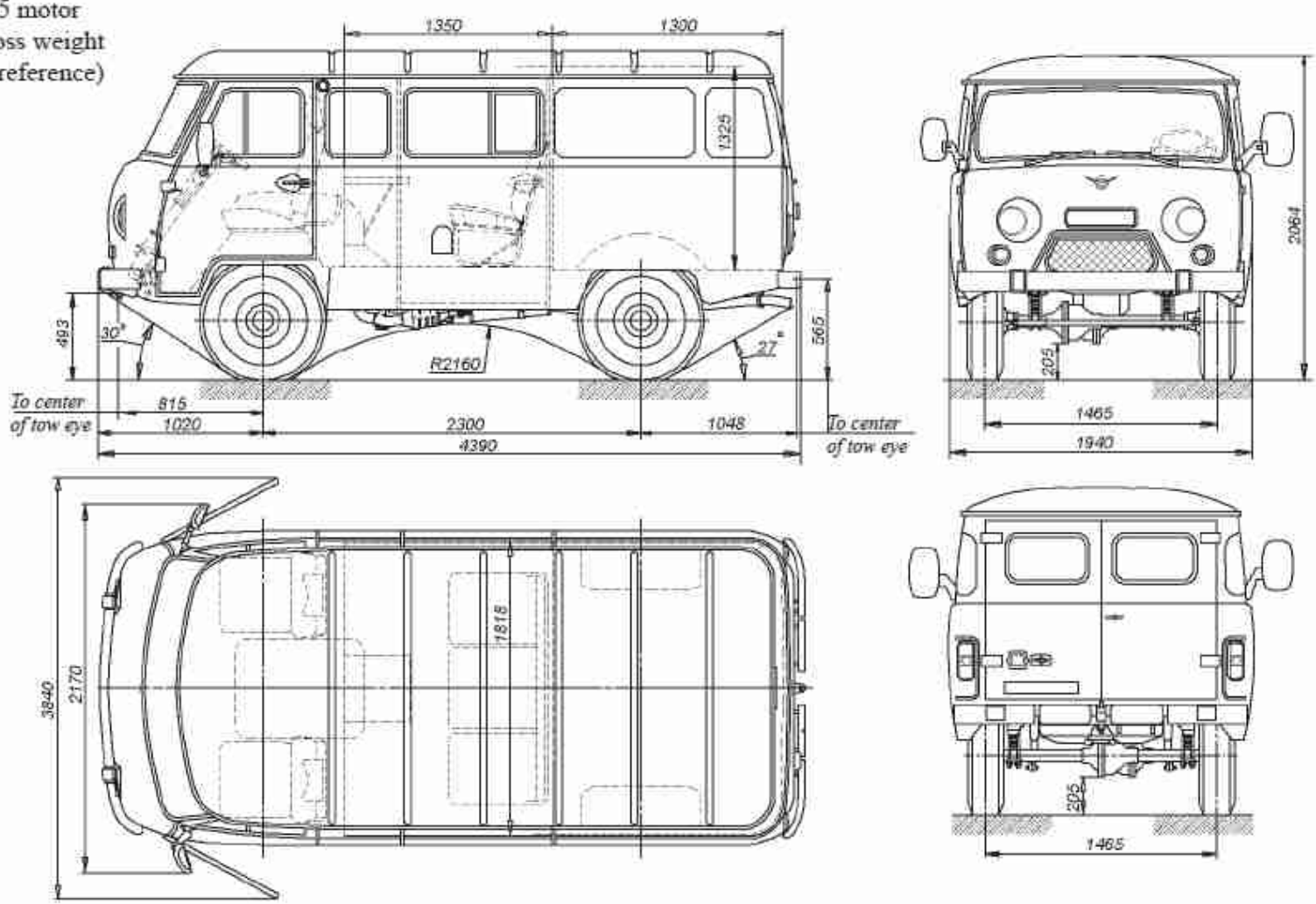


Fig. 1.7. Overall dimensions (averaged) of UAZ-390995-04 motor vehicle with maximum gross weight (dimensions are given for reference)

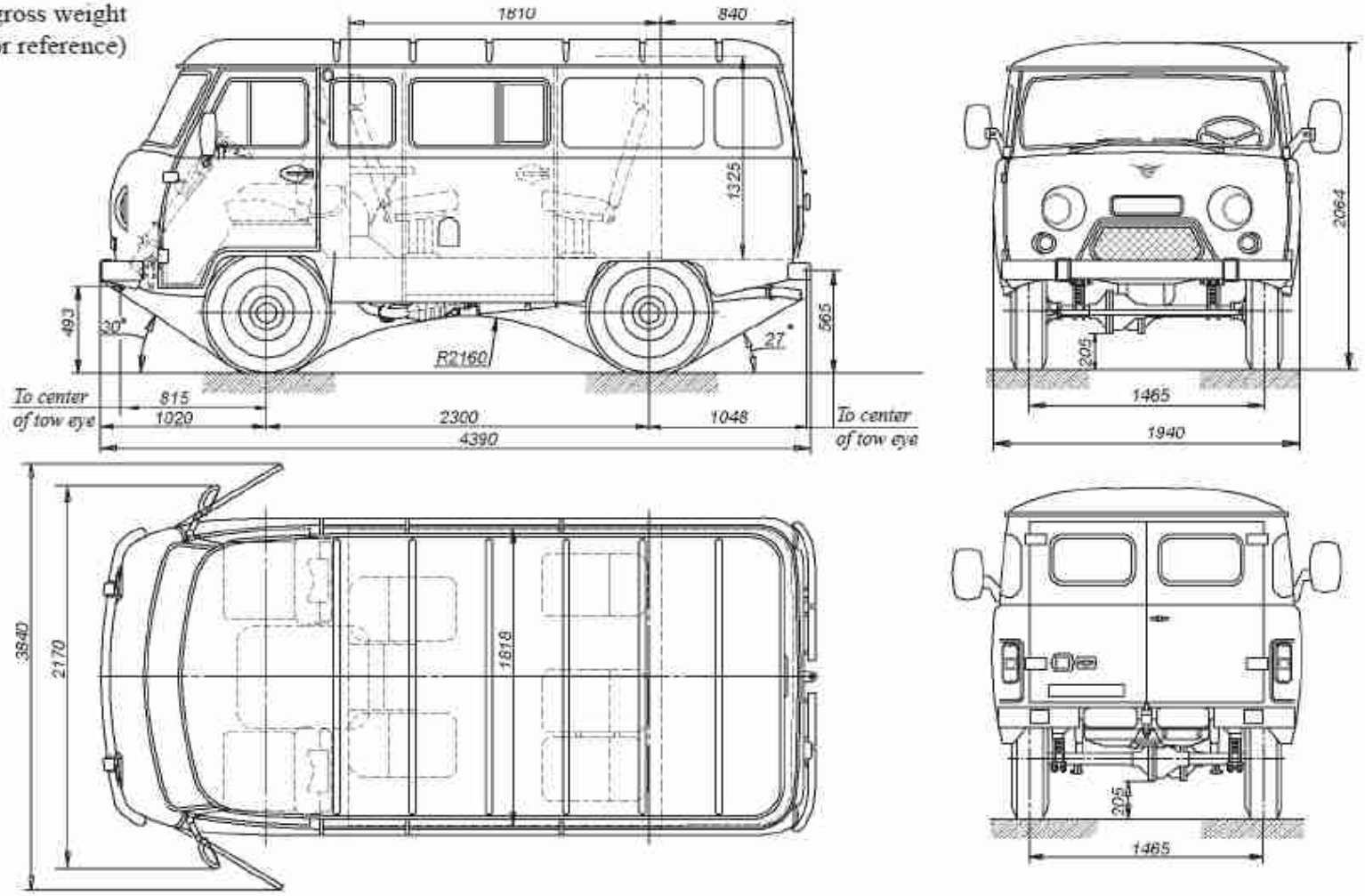


Fig. 1.8. Overall dimensions (averaged) of UAZ-330365 motor vehicle with maximum gross weight (dimensions are given for reference)

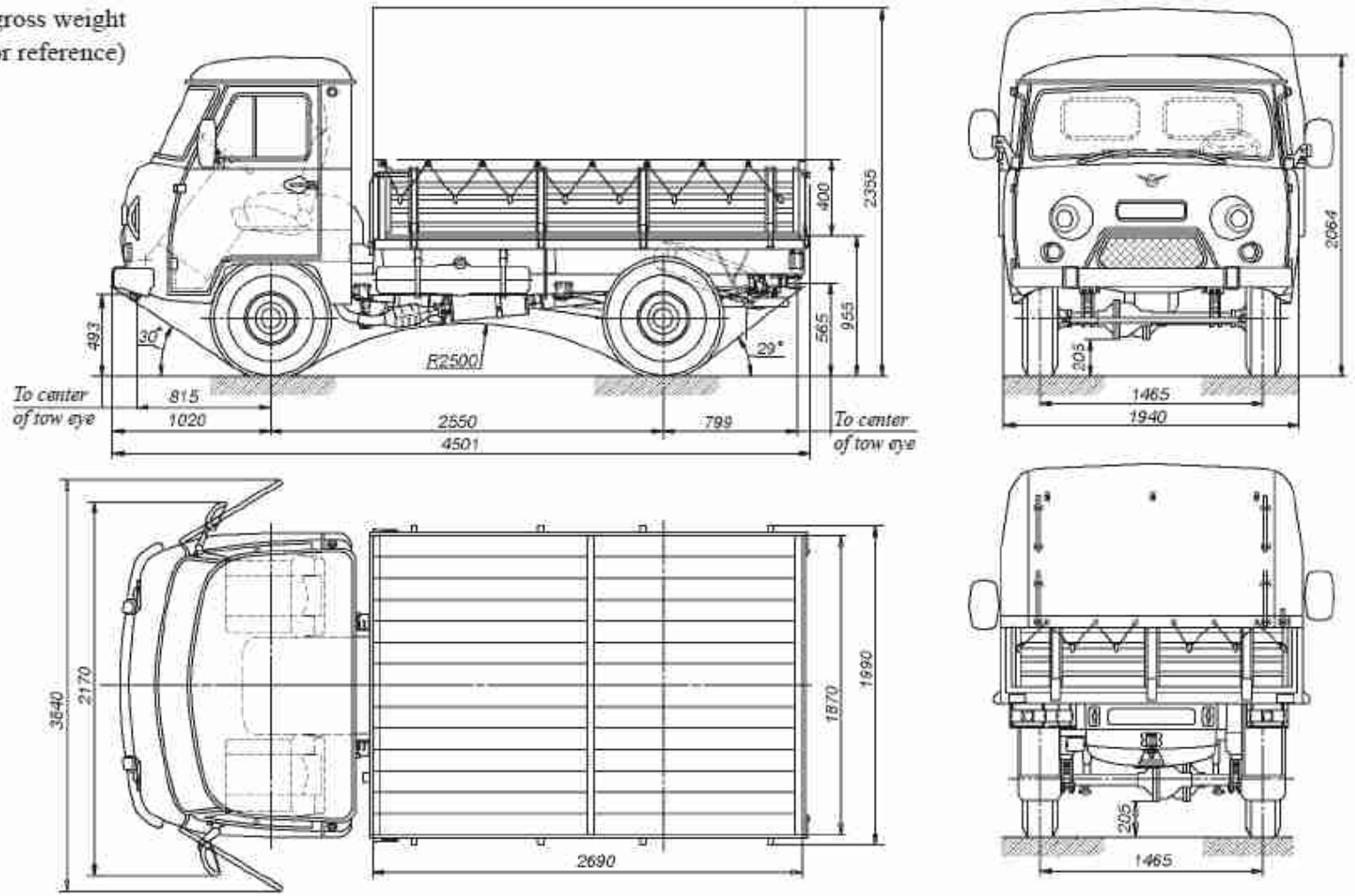


Fig. 1.9. Overall dimensions (averaged) of UAZ-330395 motor vehicle with maximum gross weight (dimensions are given for reference)

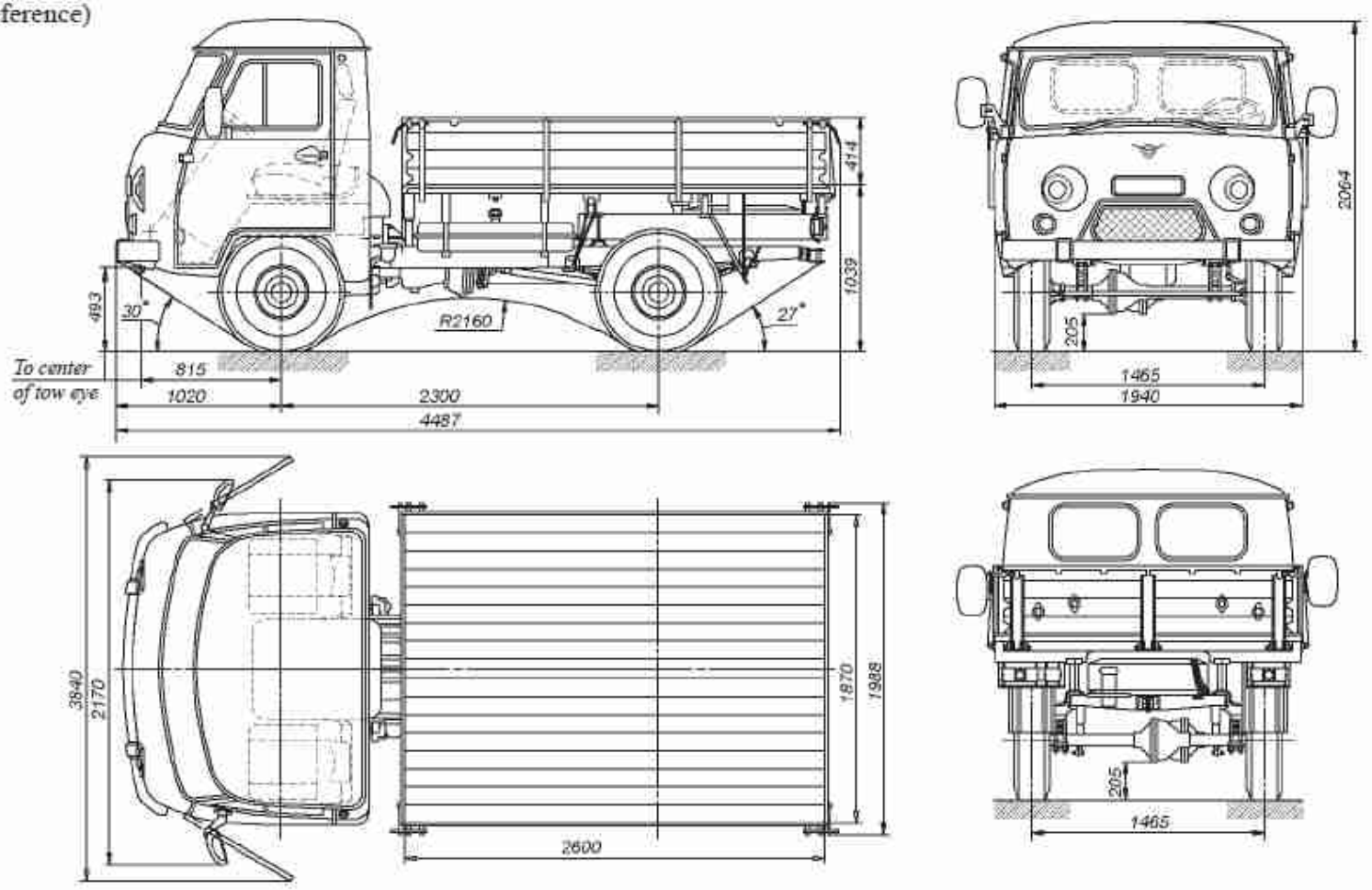
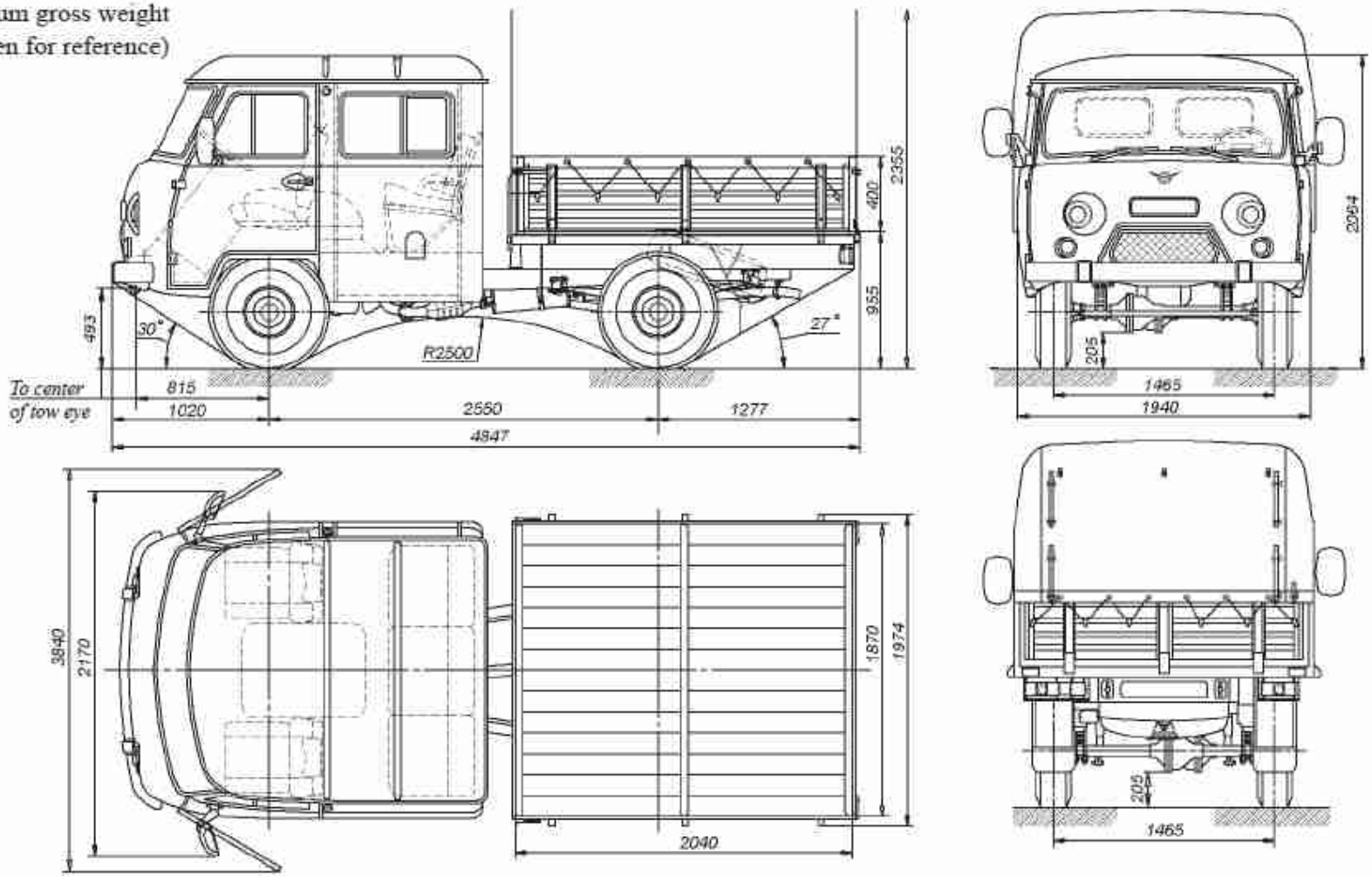


Fig. 1.10. Overall dimensions (averaged) of UAZ-390945 motor vehicle with maximum gross weight (dimensions are given for reference)



Vehicles manufactured in "T" version are designed for operation under ambient air temperatures between –10°C and +50°C, relative air humidity of up to 80 % at +27°C under the above listed conditions for "U" version vehicles.

The plus ("+") sign near the part (assembly) description means that this part (assembly) shall be installed into the motor vehicles depending on the configuration.

MOTOR VEHICLE MARKING

Engine identification number (Fig. 1.11):

I - the Vehicle Description Section (VDS) consists of six symbols. The first five symbols (digits) stand for the engine model. If the engine model designation includes less than five digits, zeros shall be filled in blanks. The sixth symbol (zero or letter) refers to the engine configuration option; II - the Vehicle Identification Section (VIS) has of eight symbols. The first symbol (letter or digit) means year of manufacture of the engine, the rest of the symbols (digits) denote the engine serial number.

The engine identification number is stamped on the left side of the cylinder block.

Vehicle identification number (Fig. 1.12) is stamped on Manufacturer's name plate and on roof flute lower plane (on vehicles UAZ-220695, UAZ-220695-04, UAZ-396295 and their versions — in two places: "a" and "b"; on vehicles UAZ-374195, UAZ-374195-05, UAZ-330395, UAZ-330365, UAZ-390995, UAZ-390945 and their versions — in one place: "b").

Body (cab) identification number (Fig.1.12) is stamped on the front right door opening horizontal panel.

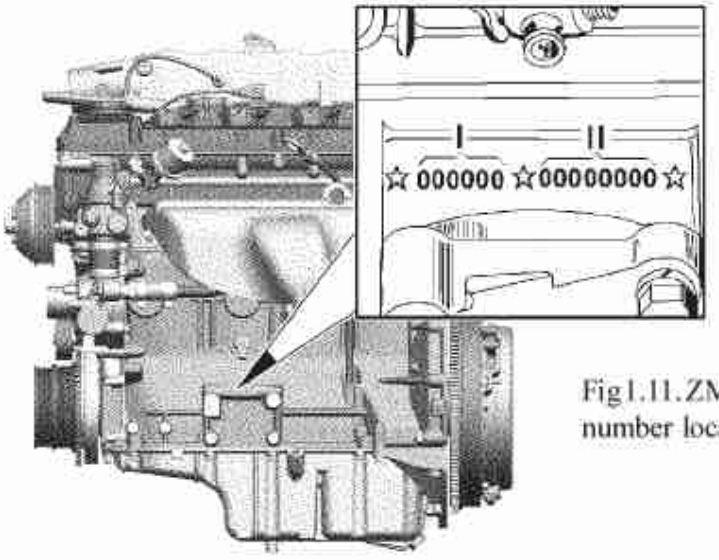


Fig 1.11. ZMZ-40911 engine identification number location

Chassis identification number is stamped on the right-hand frame side member, at the rear part.

Name plate is fitted inside the cab, on the front top panel, under the right sun visor. This plate also contains the engine model and version.

Instruction plates are located:

- at the left sun visor inner side;
- on both sides of a partition
  (on vehicles UAZ-220695, UAZ-220695-04, and UAZ-396295 only);
- on the left inner side panel
  (on vehicles UAZ-220695, UAZ-220695-04, and UAZ-396295 only).

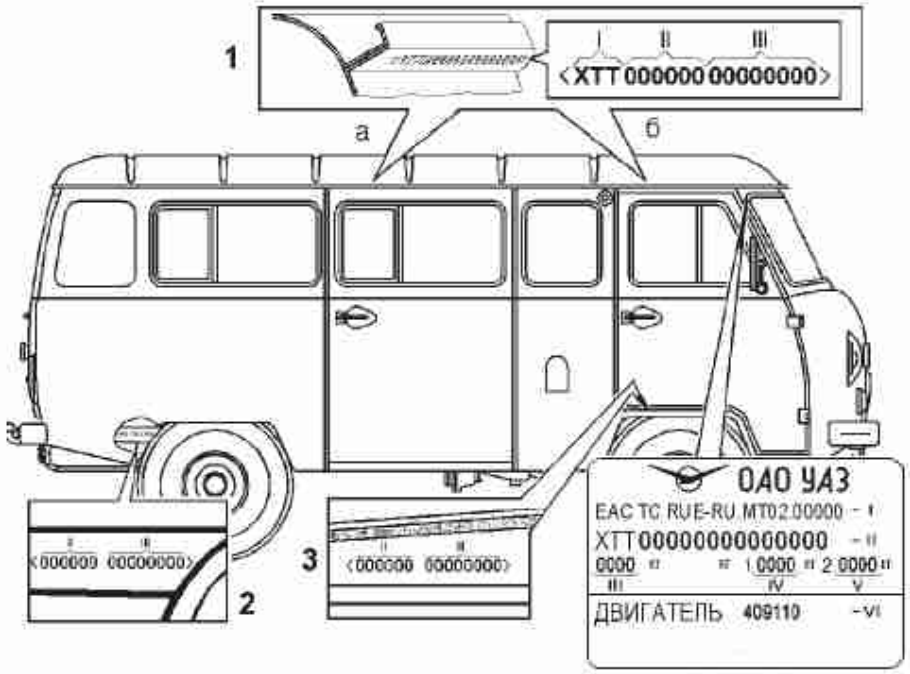


Fig. 1.12. Vehicle marking:

1 — Vehicle identification number:
a, b — for UAZ-220695, UAZ-220695-04, and UAZ-396295 vehicles;
b — for UAZ-374195, UAZ-374195-05, UAZ-330365, UAZ-330395, UAZ-390945; and UAZ-390995 vehicles;
2 — Chassis identification number;
3 — Body (cab) identification number;
4 — Name plate;
I — Transport Vehicle Type Approval full number;
II — Vehicle identification number (VIN code);
III — Vehicle maximum allowable weight;
IV — Maximum allowable load on the front axle;
V — Maximum allowable load on the rear axle;
VII — Engine model identification;

Table 1.1

SPECIFICATION

Description	UAZ motor vehicles' models					
	374195(-05)	396295	220695(-04)	390995(-04)	330365 (330395)	390945
1	2	3	4	5	6	7
GENERAL DATA						
Vehicle dimensions [1]	See Fig. 1.1 - 1.10					
Vehicle type	All-terrain, two-axle, axle configuration 4x4					
Maximum load capacity (including driver and passengers), kg	1000	675	875	1000	1300 (990)	1150
Maximum weight of cargo transported in the cargo compartment, kg	–	–	–	475	–	–
Maximum weight of cargo transported on the cargo bed, kg	–	–	–	–	1130 (840)	700
Number of seats (including driver's seat) + barrow	2 (5)	5+2	10 (9)	5 (7)	2	5
Maximum allowable gross vehicle weight, kg	2730 (2845)	2880	2880	2830	3070 (2660)	3070
Gross weight distribution by axles, kg:						
on the front axle	1300 (1350)	1440	1440	1360	1435 (1230)	1435
on the rear axle	1430 (1495)	1440	1440	1470	1635 (1430)	1635

[1] Dimensions are averaged, shown for reference and can vary depending on operation conditions, installed tires, their condition and tire pressure, motor vehicle load, suspension condition, etc.

Table 1.1 (continued)

1	2	3	4	5	6	7
Vehicle curb weight[1], kg	1805 (1920)	2000	2015 (2005)	1890 (1920)	1845 (1745)	1995
Curb weight distribution by axles, kg:						
on the front axle	1085 (1160)	1180	1195 (1185)	1135 (1155)	1180 (1095)	1220
on the rear axle	720 (760)	820	820 (820)	755 (765)	665 (650)	775
Maximum gross weight of a towed trailer, kg:						
with brakes	1500 [2]					
without brakes	750 [2]					
Minimum turning radius on the centerline of the front outer wheel trace (as to the turning center), m, not more than	6.3				7.0	
Minimum outer turning circle radius as to the front bumper point, the farthest from the turning center, m, not more than	6.8				7.5	
Maximum gradeability, degrees	30					
Maximum fording depth, m	0.5					
Maximum speed, km/h	127				115	
Fuel consumption, l/100 km, when driven at a constant speed of 90 km/hr	13.5 [3]				17.0 [3]	

[1] Including all liquids, tools, additional equipment, a spare wheel, and a driver

[2] Trailer towing is allowed only in the presence of a ball-type towing hitch, properly certified as a part of the road-train as per the established procedure

[3] Fuel consumption value is used to determine the motor vehicle technical condition and shall not be regarded as the operation standard. Fuel consumption measuring accuracy is only ensured in special testing in strict adherence with requirements of GOST 20306-90, when the motor vehicle total mileage reaches 9000-10000 km

Table 1.1 (continued)

1	2	3	4	5	6	7
ENGINE						
Model	ZMZ-40911					
Type	4-stroke, gasoline, with fuel injection system					
Number of cylinders	four					
Cylinders arrangement	In-line, vertical					
Cylinders operation sequence	1-3-4-2					
Bore, mm	95.5					
Stroke, mm	94					
Engine displacement, l	2.693					
Compression ratio	9					
Minimum crankshaft rpm at idle, min^{-1}	800–900					
Maximum power capacity, kW (hp): net, according to Regulations 85 EEC UN (GOST R41.85)	82.5 (112.2) at 4250 min^{-1}					
Maximum torque, N·m (kgf·m), according to Regulations 85 EEC UN (GOST R41.85)	198.0 (20.2) at 2500 min^{-1}					
Lubrication system	Combined: pressurized and by splashing					
Housing ventilation	Closed system					
Fuel System	With forced fuel supply					
Fuel	Unleaded gasoline Regular-92 (AI-92-4), GOST R 51105; AI-92-K4, GOST 32513					
	Allowable: Premium Euro-95, type II (AI-95-4) and Super Euro-98, type II (AI-98-4) per GOST R 51866, AI-95-K4, AI-98-K4, GOST 32513.					
Cooling system	Liquid, closed circuit, with forced circulation					

Table 1.1 (continued)

1	2	3	4	5	6	7
TRANSMISSION						
Clutch:						
clutch type	Dry type, single disk					
actuator type	Hydraulic					
Gearbox:						
gearbox type	Mechanical, synchronized, four-/five-speed					
control type	Mechanical					
Transfer case:						
gearbox type	Two-speed					
control type	Mechanical					
gear ratios:						
direct drive	1.00					
underdrive	1.94					
power takeoff [1)]	Possible for actuation (while driving or parked) of special devices installed inside the body, at that power takeoff mechanism shall be installed by the customer. Permissible power takeoff is 40 %					
Propeller shaft:						
drive type	Open type, consists of two shafts. Each shaft has two universal joints with spiders on needle bearings					
Front and rear driving axles:						
axle type	Single-reduction, driving					
Final drive gear ratio	4.625					
axle differential	Conical, with 4 planet wheels					
front axle turning knuckle joints	Ball-type constant velocity joints					

[1)] Power takeoff gear shall be properly agreed with the Manufacturer as per the established procedure

Table 1.1 (continued)

Description	UAZ motor vehicles' models	
	374195, 390995, 330365, 330395, 390945	396295, 220695
1	2	3
CHASSIS		
Suspension:		
suspension type	Four longitudinal semi-elliptic leaf springs	On four longitudinal semi-elliptic leaf springs, with anti-roll bar in the front suspension; rear leaf springs have helpers
shock absorbers	Four, hydraulic, telescopic, double-side action	Four, telescopic, double-side action: front - hydro-pneumatic, rear - hydraulic
Wheels and tires:		
wheels	Disk type with solid rim, steel, rim size 6½ J×16H2 with offset ET + 40 mm	
tires	radial tubeless 225/75R16	
CONTROL SYSTEMS		
Steering gear type	Screw-ball nut-rack-sector with hydraulic power, or concave worm with two-ridged roll	Screw-ball nut-rack-sector with hydraulic power
Steering gear ratio	20.3 (average)	17.3

Table 1.1 (continued)

1	2	3
Brakes:		With anti-blocking system (ABS)
working brake type	Disk brakes on front wheels and drum brakes on rear wheels	
working brake actuator type	Hydraulic, vacuum powered, separate for front and rear wheels	
parking brake type	Drum type with internal shoes	
parking brake actuator type	Mechanical	
ELECTRIC EQUIPMENT		
Wiring system	Single-wire, negative pole is connected to vehicle's chassis	
System voltage (nominal), V	12	
Alternator	AAK 5572 14V 80A by Iskra, or AAK 5730 14V 80A by Pramo-Electro, or 5122.3771 14V 80A by Pramo-Electro, 3212.3771-10 14V 90A by BATE	
Battery	6ST-66A	6ST-66A w/ventilation pipe
Spark plugs	AU14DVRM GOST P53842, DR17YC-f by BRISK	
Engine control module	BOSCH	
Starter motor	AZE 2154 12V 1,9kW or AZE 2203 12V 1,9kW by Iskra, or 6012.3708 12V 1,7kW by ZiT	
Ignition switch	31514-3704010 or 315196-3704005	
Horn	20.3721-01, electric, vibrational type	
Rear fog light	2452.3716	
Fuses	Relay / Fuse Box	
Turn indicators contact breaker	495.3747-047	
Windshield wiper	80.5205 or 82.5205 with two wiper blades	

Table 1.1 (continued)

1	2	3
ADJUSTMENT DATA		
Deflection of fan and power steering pump driving belt under 4 kgf, mm	5-8	
Deflection of water pump and alternator driving belt under 8 kgf force, mm	13-15	
Spark plug electrodes gap, mm:	$0.7^{+0.15}$	
Coolant temperature in the cooling system, °C	80-105	
Brake pedal free play, mm	5-14	
Front wheels toe-in	0°4'-0°10' (0.5-1.5 mm)	
Inner front wheel maximum turning angle, degree	26-27	
Steering system total play (steering-wheel angle from the position corresponding to steerable wheel wedge in one direction to the steering wheel position corresponding to steerable wheels wedge in the opposite direction), deg., not more than	20	

Table 1.1 (continued)

Description	UAZ motor vehicles' models					
	374195(-05)	396295	220695(-04)	390995(-04)	330365 (330395)	390945
1	2	3	4	5	6	7
TIRE PRESSURE, MPa (kgf/cm2):						
Front wheels						
225/75R16	0.22 (2.2)	0.24 (2.4)	0.24 (2.4)	0.21 (2.1)	0.24 (2.4) (0.21 (2.1))	0.24 (2.4)
Rear wheels						
225/75R16	0.24 (2.4) (0.25 (2.5))	0.24 (2.4)	0.24 (2.4)	0.24 (2.4)	0.27 (2.7) (0.24 (2.4))	0.27 (2.7)
FUELING DATA (liters)						
Fuel tanks: [1]						
main	50	50	50	50	50	50
additional	27	27	27	27	—	—
Engine cooling system (including heater)	12.7 (13.7)	13.7	13.7	13.7	13.7	13.6
Engine lubrication system (excluding oil cooler volume)	6.5					

[1] Amount of fuel fully consumed at the engine operation

Table 1.1 (end)

1	2	3	4	5	6	7
Gearbox housing						
five-speed			1.7			
four-speed			1.0			
Transfer case housing			0.7			
Front axle housing			0.88			
Rear axle housing			0.80			
Steering mechanism housing, concave worm type with two-ridged roll			0.25			
Hydraulic power steering system (oil tank) (steering gear of screw-ball nut-rack-sector with power steering type)			1.3			
Hydraulic clutch actuator			0.20			
Hydraulic brake actuator			0.52 (0.60 for UAZ-330365, and UAZ-390945 vehicles)			
Windshield wiper tank			2			

Chapter 2. SAFETY REQUIREMENTS AND WARNINGS

SAFETY REQUIREMENTS

1. When operating a motor vehicle, it is necessary to observe road traffic regulations and safety requirements and keep a motor vehicle in good repair, timely carrying out its maintenance and correcting possible malfunctions in order not to injure yourself and others.

2. The driver is responsible for passengers. Therefore, the driver shall control that passengers observe safety rules. Be especially careful when children are in a motor vehicle. Do not leave children unattended in a motor vehicle.

3. It is prohibited to turn ignition off and remove the key from the ignition starter switch while driving a motor vehicle. Engine stoppage will lead to braking capacity reduction, and the steering system shaft is blocked by anti-hijack device when removing the key, and the motor vehicle becomes uncontrollable.

4. When getting off a motor vehicle, do not leave door and ignition keys inside it.

5. Before opening a door ensure that it will not be a hindrance for other road users.

Before closing a door, make sure it will not catch someone or something.

It is prohibited to drive a motor vehicle with any door or tail board opened.

Check operability and reliability of bodyshell doors and tail board locking mechanisms before driving.

6. Safety belts are efficient means of driver and passengers protection against drastic consequences of traffic accidents.

Use of safety belts is mandatory!

7. Worn or damaged tires, underpressure or overpressure in them, warped wheels or weak wheel fastening can cause car accident.

8. If steering system or brake system do not work properly, further motor vehicle driving or towing with a tow-rope is not allowed. In this case you shall use two wheel vehicle towing or tow truck service.

9. It is strictly prohibited to disassemble shock absorbers.

10. To avoid carbon monoxide poisoning, do not warm up the engine in a closed room without good ventilation.

11. Vehicle units heating with open flame is prohibited.

12. Keep the engine clean (engine fouling, especially its crankcase, can cause fire).

13. Make sure that fuel tank's plugs are closed tightly and there are no leaks from fuel lines.

14. The catalyst operating temperature is 400-800°C. The motor vehicle shall not be operated, if no protective screen is installed on the catalyst. During the motor vehicle motion and in standstill, make sure the exhaust system has no contact with inflammable materials (e.g. dry grass).

15. When handling low-freezing liquid, fuel or brake fluid, please observe the following rules:

- avoid any operations that can result in these liquids entering your mouth cavity;

- in case of skin contact, immediately wash the liquid away with water and soap;

- do not allow liquid spills inside the vehicle or in a closed room. Wash the spill with water, and provide dry them in ventilation;

- if liquids spill on clothes, dry it on the open air before washing;

- moisten the gasoline soot with kerosene when scraping to avoid ingress of the soot toxic substances into your respiratory system;

- observe fire safety rules when handling fuel.

16. When a motor vehicle stops it shall be braked with the parking brake.

17. Use extreme caution when handling electrolyte. Follow these rules to prevent poisoning and chemical burn:

- *strictly observe safety requirements specified in the battery manual;*
- *avoid getting electrolyte or its fumes into your mouth cavity, respiratory system or eyes, it is very dangerous;*
- *avoid any operations that can result in electrolyte getting onto your skin. If electrolyte gets onto the skin, carefully wipe it off with cotton wool and immediately rinse remained traces off your skin with 5 % solution of ammonia or sodium carbonate;*
- *collect spilled electrolyte with a special filler bulb or an areometer, flush it with water and ventilate the room;*
- *charge the battery after it is removed from a motor vehicle and filler plugs are unscrewed;*

- the battery must be charged in a well-ventilated room. Electrolyte fume accumulation is dangerous to health and explosion hazardous.

18. Do not wash the vehicle with the engine on.

19. A lifting jack installed improperly can cause serious injury or motor vehicle damage. It is strictly prohibited to carry out works under a motor vehicle supported by a jack only.

20. The following is prohibited on steep declines:

- clutch disengaging, to avoid driven disk breakage;

- driving with gearbox and transfer case gears disengaged;

- engine stopping due to braking efficiency loss.

21. The following requirements shall be met when carrying out maintenance and operating repair of a motor vehicle:

- before starting work, check tools and accessories for normal operation, arrange work clothes: do cuff up, tuck clothes in so that there will not be any hanging ends, tuck hair under closed-body hair cover;

- for any works, the motor vehicle must be securely arrested with brakes;

- do not perform any motor vehicle maintenance and repair with the engine running, except for specific works, that require engine start — in such a case, take particular care;

- avoid dangerous approaching of hands, clothes parts, and tools to moving driving belts, pulleys, etc.;

- the fuel system downstream of the fuel pump is pressurized with the engine on; therefore, it is not allowed to carry out maintenance (e.g. tighten joints) or repair of subsystems with the engine on or immediately after its shutdown;

- take due care when opening the radiator cap of the engine cooling system to avoid scald;

- dismount fuel tanks before using electric weld;

- observe fire safety rules.

22. Waste oils and special liquids shall be collected and sent for recycling or disposal.

23. A number of safety requirements are detailed in the respective chapters of the Manual.

WARNINGS

1. During the initial operating period all recommendations specified in the chapter "New Vehicle Running-in" shall be strictly observed.

2. Do not drive off with the engine not warmed up. Avoid high engine rpm after cold start.

Engine heating at high rpm for faster heat up is forbidden.

In order to prevent any difficulties when starting the engine, follow the instructions of the chapter "Engine Start".

3. In case of abnormal noises and knocks in the running engine find out their cause, and do not operate the motor vehicle till malfunction is eliminated.

3.1. After ZMZ-40911 engine cold start the valve hydraulic pushers knock can occur, it shall disappear in the course of engine warm-up to the coolant temperature of 80-90°C, but not more than in 30 minutes after reaching the specified temperature. If knock persists, it is necessary to check oil feed to the hydraulic pushers or to replace faulty hydraulic pushers.

4. Engage the back run in the gear box and the underdrive in the transfer case only after the motor vehicle complete stop.

5. Disengage front axle drive when driving on dry paved roads.

Avoid front axle engagement when driving the motor vehicle with small turning radii.

6. In case of malfunction of any brake circuit brake pedal stroke increases and brake efficiency decreases.

7. With the engine running, metal segments may not be removed and sparking discharge checked "to ground".

8. Avoid acids, soda solutions, brake fluid, antifreeze and fuel drop on the painted surface of the bodyshell, wheels and rubber parts.

9. Avoid impact loads on the motor vehicle chassis. In case of front wheels hard blows carefully inspect the wheels, all parts of the front axle, steering links, steering box, engine oil pan and correct detected defects.

10. To prevent excessive loads on the axle differential avoid long-term slipping of one of the wheels.

11. When operating a motor vehicle in cold season (ambient temperature is 0°C and below) it is recommended to install a cold weather radiator cowl cover.

12. Store the battery in a heated room in case of vehicle standstill for more than 12 hours at ambient temperature below –30°C.

13. To prevent oil overheating and power steering pump malfunction it is not recommended to hold the steering wheel in the extreme position for more than 20 sec.

14. Use only recommended lubricants and operating fluids listed in the service log book.

15. Use unleaded gasoline only.

16. Do not start the engine with incorrectly installed high-voltage wires between ignition coils and spark plugs, and low-voltage wires to ignition coils.

17. When using a lubrication gun with the nozzle unscrewed, remove a spring and a ball to avoid their falling into units containing oils.

18. The vehicle is fitted with hard towing device that can be used for short-term (emergency) towing only.

19. Simultaneous haulage of passengers and cargo (except for hand luggage) in passenger and medical compartments of UAZ-220695, UAZ-390995, UAZ-396295, UAZ-390945; and in passenger and cargo compartment of UAZ-374195-05 is not allowed.

20. Transportation of passengers on cargo beds of UAZ-330365, UAZ-330395, and UAZ-390945 is not allowed.

21. UAZ-220695 and UAZ-220695-04 vehicles cannot be used as public or commercial transportation means.

22. Opened rear doors or rear ramp of your vehicle hide rear lights from other drivers. Install a warning triangle according to GOST R41.27-99 on the road before opening rear doors or rear ramp of your vehicle.

23. Long-term, fault-free and safe operation of a motor vehicle depends on accurate compliance with requirements hereof and the vehicle log book.

24. Tightening torques of the main threaded couplings are shown in Appendix 2 hereof.

25. The plant continuously improves design of its motor vehicles, for which is why the latest engineering changes not affecting operation may not be reflected in this edition.

Chapter 3. CONTROLS AND EQUIPMENT IN DRIVER/PASSENGER COMPARTMENT

Controls and equipment location is shown in Fig. 3.1:

1 — instrument panel (Fig. 3.3);

2 — ignition switch (Fig. 3.5);

3 — steering wheel;

4 — multifunctional understeering switches (see Fig. 3.5);

5 — sun visor;

6 — ceiling light. A switch is installed next to the ceiling light;

7 — internal mirror (for UAZ-220695 and UAZ-220695-04);

8 — front handle;

9 — glove box;

10 — door lock internal handle;

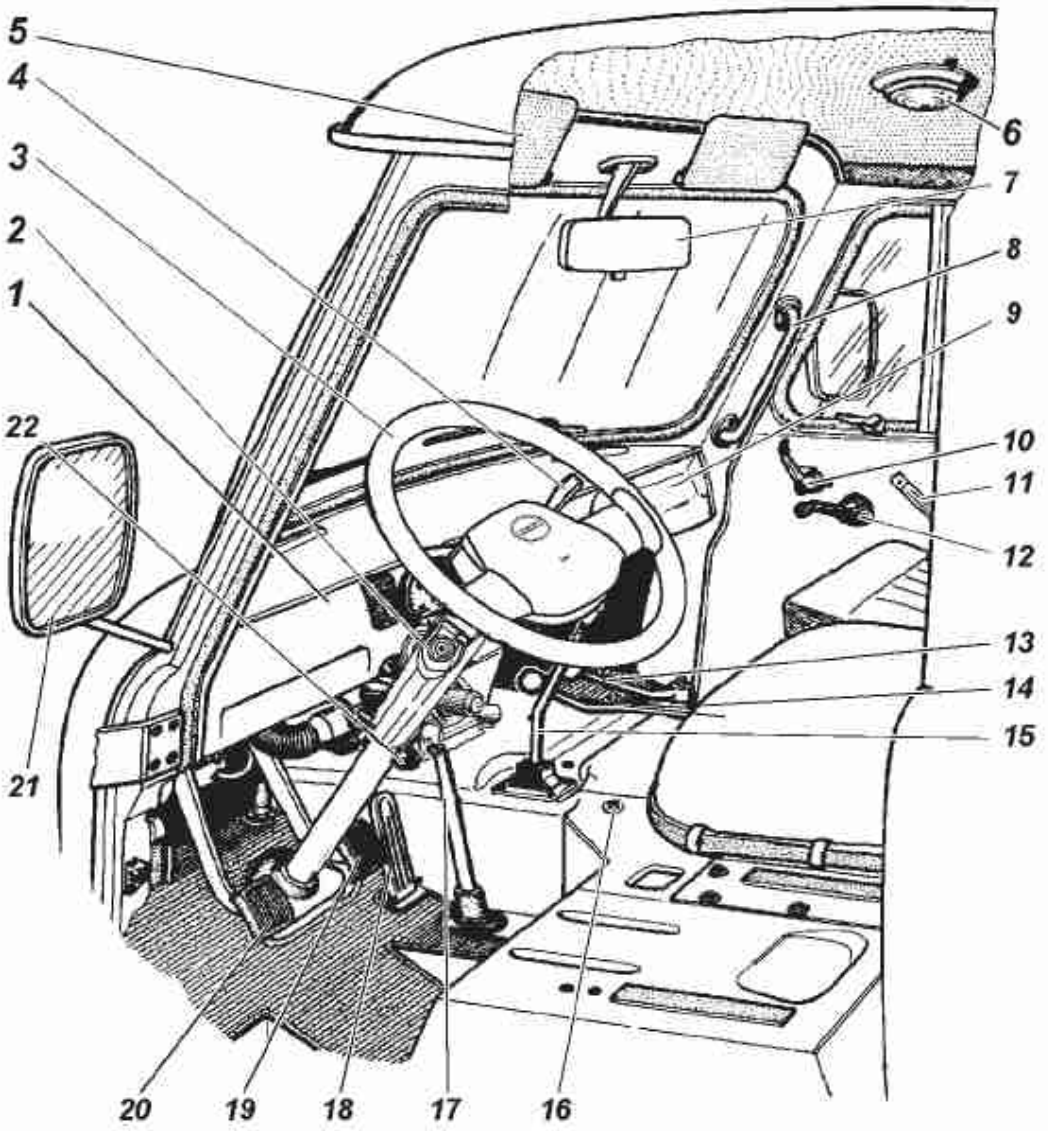


Fig. 3.1. Controls (see item description in the text):

11 — door handle;

12 — window lifter handle;

13 — front axle engagement lever (Fig. 3.2). It has two positions: front — axle engaged; rear — axle disengaged;

14 — transfer case gear change lever (Fig. 3.2). It has three positions: front — direct drive engaged, middle — neutral, rear — lower gear engaged;

15 — gearshift lever (Fig. 3.2);

16 — heater system valve control link handle;

17 — parking brake lever;

18 — accelerator pedal;

19 — brake pedal;

20 — clutch pedal;

21 — outside rear view mirror;

22 — ventilation and heating hatch cover actuator handle.

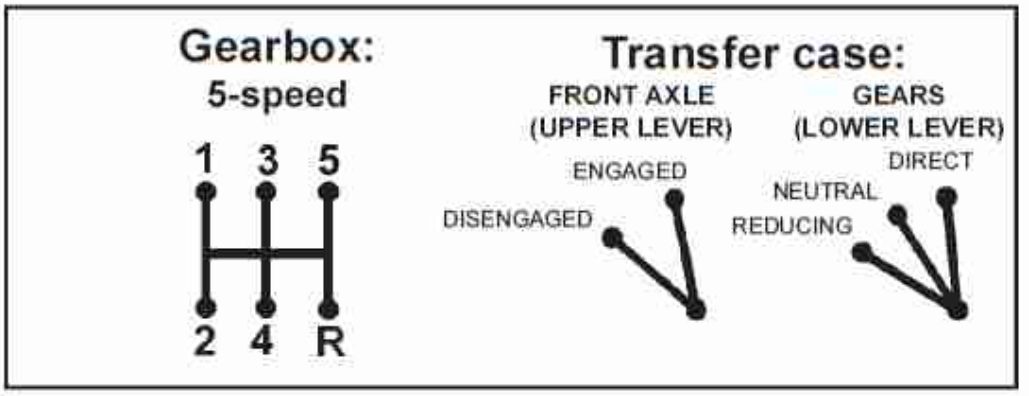


Fig. 3.2. Diagram of gearbox and transfer case lever positions

INSTRUMENT PANEL

The following is installed on the instrument panel (Fig. 3.3):

1 — diagnostic socket;

2 — cover plug;

3 — cover plug;

4 — cover plug;

5+ — manual headlights corrector. Headlight beam inclination is adjusted by rotating this knob, depending on vehicle loading:

0 — a vehicle with a driver only;

1 — passengers on all seats (for UAZ-396295 only);

1 — a vehicle with a driver and maximum permitted cargo load (except for UAZ-396295);

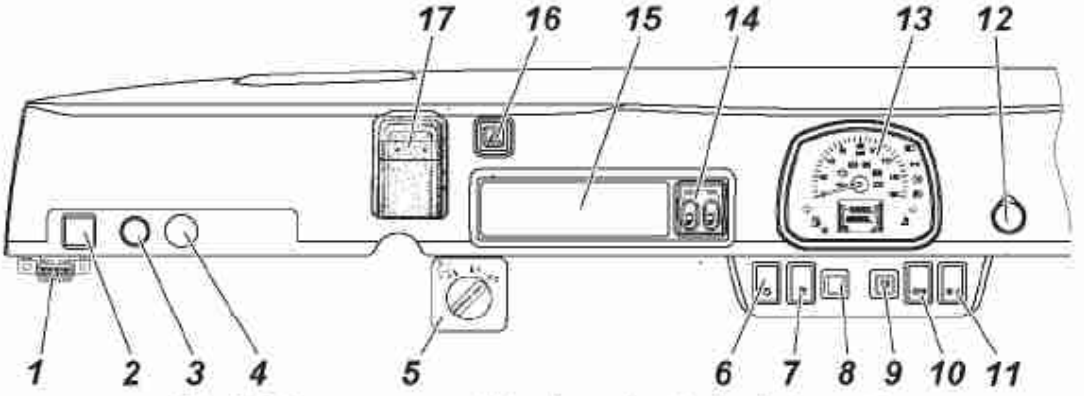


Fig. 3.3. Instrument panel (see item description in the text):

2 — a vehicle with a driver and maximum permitted cargo load (for UAZ-396295 only).

Headlights shall be adjusted strictly by marks, depending on vehicle loading. In case of other loading options (provided the maximum gross weight is not exceeded), a position is selected so that the road illumination by low beam is within normal range, without blinding the oncoming drivers;

6 — external lights switch;

7 — **fuel gauges switch for different tanks** (not installed on UAZ-330365, UAZ-330395, and UAZ-390945);

8 — cover plug;

9 — rear fog lights switch;

10 — cab heater switch;

11 — saloon heaterswitch (except for UAZ-330395, UAZ-330365, and UAZ-374195);

12 — onboard power socket;

13 — instrument cluster;

14+ — seats heating control module;

15 — box for small pieces;

16 — hazard switch;

17 — cover of clutch fluid reservoir hatch.

Instrument Cluster

The instrument cluster is shown in Fig. 3.4.

Green and blue indicators inform a driver about normal operation of the system to be switched on. Orange indicators warn a driver of necessity for adoption of measures to ensure further motor vehicle normal operation. Red indicators warn a driver of emergency operation of units.

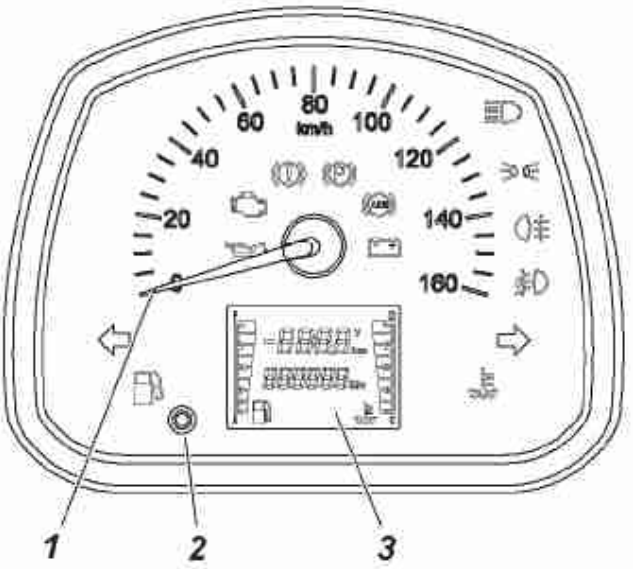


Fig. 3.4. Instrument cluster (see item description in the text):

Motor vehicle operation with continuously lit red indicator (even one) is not allowed.

1 - speedometer with indicators.

Indicators on the speedometer:

— **oil pressure warning indicator of the motor vehicle's engine lubrication system** (red). Indicator lights up after starting up the ignition and goes down after starting the engine at increased crankshaft rpm.

— **complex microprocessor engine control system malfunction indicator** of the engine control system elements, that affect on exhaust gas toxicity (yellow). It lights up at starting up the ignition and goes down after starting the engine. **Indicator switching on indicates malfunctions of engine components or the exhaust system, that affect exhaust gas toxicity. When the indicator switches on, if it is not accompanied by significant deterioration of riding qualities, driving is permitted at low speed to the nearest authorized service station of UAZ PJSC, to carry out diagnostic works.**

Prolonged operation with the malfunction indicator switched on can lead to malfunction of the engine control system elements.

— **service brake system and EBD malfunction indicator** (red).

— **parking brake engagement indicator** (red).

— **anti-blocking brake system (ABS) fault indicator** (yellow). (It is not connected on UAZ-374195, UAZ-330395, UAZ-330365, UAZ-390945, and UAZ-390995).

 — **battery discharge indicator** (red). If it lights up with engine on, it indicates absence of battery charge.

 — **high beam ON indicator** (blue).

 — **parking lamps ON indicator** (green).

 — **rear fog lights ON indicator** (orange).

 — **front fog lights ON indicator** (green).

 — **right turn and hazard light ON indicator** (green).

 — **left turn and hazard light ON indicator** (green).

 — **indicator of coolant abnormal overheating** (red).

 — **low fuel level indicator** (yellow). It lights up when less than 9 liters of fuel is left in the right tank.

2 — instrument cluster button. Switch over by pressing the button.

3 — LC-display shows the following functions of the trip computer:

- engine coolant temperature;
- fuel level in the tank;
- vehicle power system voltage;
- vehicle daily mileage;
- total vehicle mileage;
- current time.

Select the LC-display mode (current time, daily mileage, onboard electric system voltage) by brief (less than 0.5 s) pressing of the instrument cluster button.

To reset the daily mileage counter to 0.0 km press the instrument cluster button for more than 2 seconds while in the Daily Mileage mode.

To switch to the Clock Correction mode press the button on the instrument cluster while in the Current Time mode.

To switch to the Hours Correction mode press and hold the button for more than 2 seconds; after that hours begin blinking. A single brief pressing of the button increases hours displayed by one. If the button is pressed for more than 1 s, hours displayed are increased faster, initially with a 1 s interval, then with a 0.25 s interval; hours stop blinking in this case.

If the button is not pressed within 5 seconds, the clock switches into the Minutes Correction mode automatically. A single brief pressing of the button increases minutes displayed by one. If the button is pressed

for more than 1 s, minutes displayed are increased faster, initially with a 1 s interval, then with a 0.25 s interval; minutes stop blinking in this case. If the button is not pressed within 5 seconds, the clock switches from the Minutes Correction to the Current Time mode automatically.

MULTIFUNCTIONAL UNDERSTEERING SWITCHES AND IGNITION SWITCH

Multifunctional understeering switches and ignition switch (Fig. 3.5) are as follows:

1 — turn indicators and beam switch lever with the following positions:

I — direction indicators are OFF, low beam is ON, if headlights are switched on by the external light switch;

II — left turn indicators are ON (unstable position);

III — left turn indicators are ON (stable position);

IV — right turn indicators are ON (unstable position);

V — right turn indicators are ON (stable position);

VI (pull) — high beam is ON, disregarding external lights switch position (unstable position);

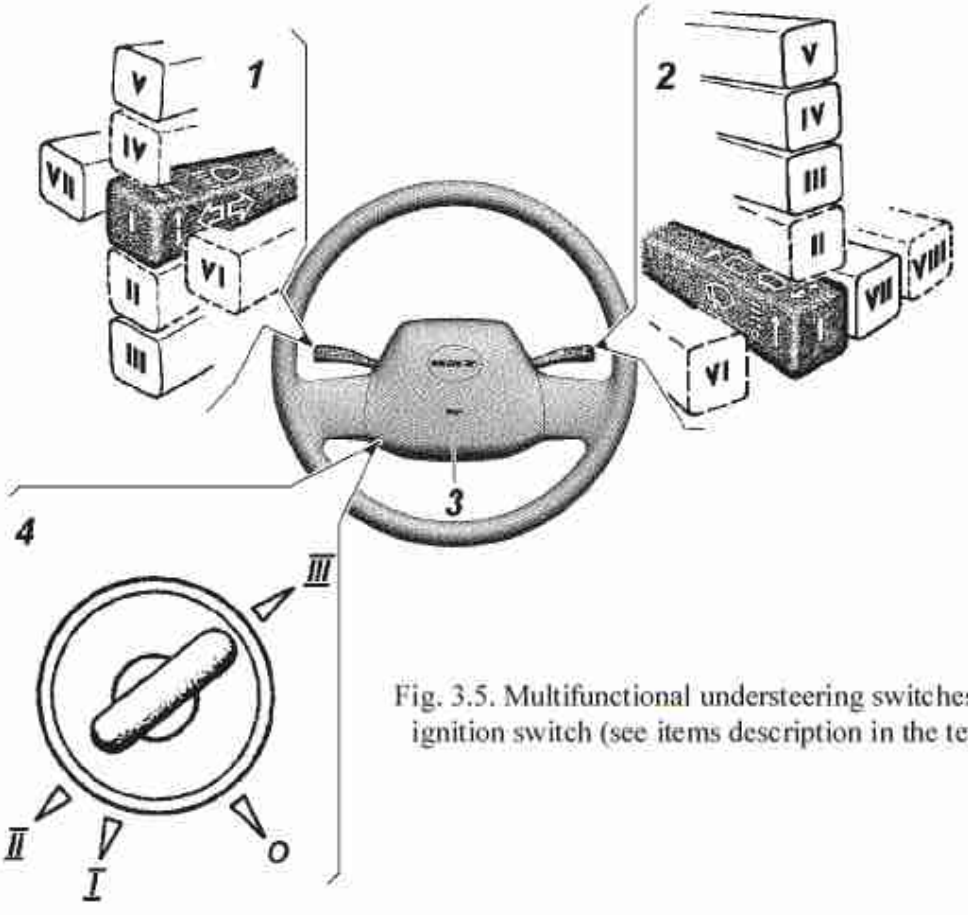


Fig. 3.5. Multifunctional understeering switches and ignition switch (see items description in the text):

VII (push) — high beam is ON, if headlights are switched on by the external lights switch (stable position).

2 — wiper and washer lever with the following positions:

I — wiper and washer are OFF;

II — windshield intermittent wiper is ON (unstable position);

III — windshield intermittent wiper is ON (stable position);

IV — windshield wiper constant mode (low speed) is ON (stable position);

V — windshield wiper constant mode (high speed) is ON (stable position);

VI (pull) — windshield wiper and washer are ON (unstable position);

VII, VIII — not used.

3 — horn buttons.

4 — ignition switch with four positions:

0 — everything is off (stable position);

I — ignition is ON (stable position);

II — starter motor is ON (unstable position);

III — parking (stable position).

The key can be removed from the lock only in position III; in this position, the locking device mechanism actuates and locks the steering system shaft.

To lock the steering system in park, set the key to position III, remove it and turn the steering wheel in any direction until it clicks, indicating that the locking device catch has matched the groove of the steering wheel shaft stop sleeve.

To unlock the steering system insert the key into the ignition starter switch and, swaying the steering wheel right and left, turn the key clockwise to position 0.

In order to avoid erroneous starter switching on with the engine on (II key position), the switch mechanism includes locking that enables engine re-start only after the key is returned to position 0.

Attention! It is not allowed to cut off IGN and remove the key from the ignition starter switch while driving a motor vehicle. Engine stoppage will lead to braking capacity reduction, and the steering system shaft is blocked by the anti-hijack device when removing the key, and a motor vehicle gets becomes uncontrollable.

Front doors, rear side door, and right back door are locked with a key by blocking the external handle mechanisms. It is not possible to lock the doors from the inside. If external handles of front and rear side doors (on all vehicles) and on the rear right door of UAZ-220695 vehicle are locked, the doors can be opened by internal handles.

Bodyshells have external rearview mirrors with enhanced range of vision, as well as an internal mirror for interior monitoring (not installed on UAZ-374195, UAZ-330365, UAZ-390945, UAZ-390995, and UAZ-396295).

The bodyshell of UAZ-396295 vehicle is separated by a partition with sliding glasses. The medical saloon is equipped with three single seats for accompanying persons, brackets and belts for barrow fixation, and handle bars in the rear door aperture.

UAZ-220695 passenger cab is equipped with one dual and six single seats with safety belts.

UAZ-220695-04 passenger cab has a table on the front partition, one dual and five single seats with safety belts.

UAZ-390995 passenger cab is equipped with a table and a triple seat with safety belts. The passenger cab is separated from the cargo compartment by a solid partition.

UAZ-390995-04 passenger cab has a table, one dual and three single seats with safety belts. The passenger cab is separated from the cargo compartment by a solid partition.

UAZ-390945 passenger cab is equipped with a three-seated soft seat with safety belts.

UAZ-374195-05 cab has a triple seat and a foldable table. The saloon is separated from the driver's cab by a partition with an unglazed window.

Seats

The front seat back inclination angle is adjusted by rotating knob 2 (Fig. 3.6).

Some versions of the driver's seat allow installation in four various longitudinal positions. To change the position: remove the seat, unscrew bolts fixing the seat cushion to the seat frame (reverse side of the seat), shift the seat cushion and screw the bolts in.

The driver's seat is adjusted longitudinally by lever 3: pull the lever located under the seat cushion which blocks the longitudinal movement of the seat and move the seat to the desired position. When the adjustment is finished, release the lever and make sure that the seat is securely fixed by moving it back and forth with the lever released.

Front seat dismounting:

- unscrew thumb-nut 1 and tilt the seat forward;
- remove stud bolts on the seat from bushes 4 located on the wheel arch, remove the seat.

To install the seat, insert stud bolts into bushes, tilt the seat back, and tighten thumb-nut 1.

Some vehicles may be equipped with non-adjustable seats.

ATTENTION! *Do not adjust the driver's seat when the vehicle is in motion.*

ATTENTION! *The "universal" child restraint system is mounted with the use of vehicle safety belts. Children under 1.5 years of age shall sit in the child restraint device only facing backwards.*

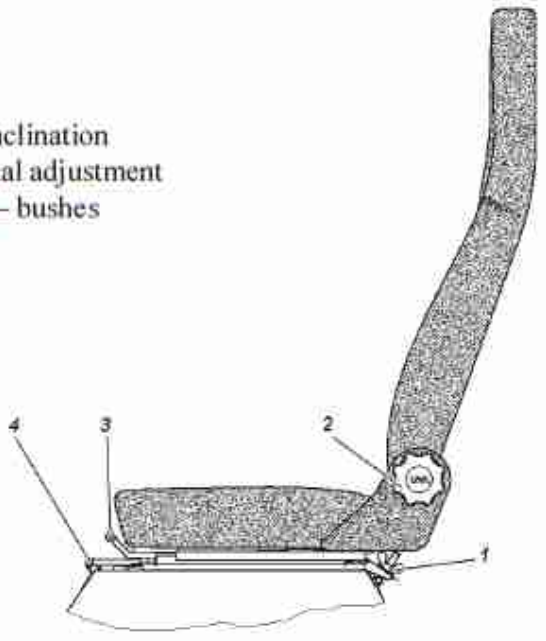


Fig. 3.6. Front seat:
1 — thumb-nut; 2 — seat back inclination adjustment knob; 3 — seat longitudinal adjustment fixation lever (driver's seat); 4 — bushes

UAZ-220695 vehicle and its versions

Weight group	Seats								
	Front passenger seat	second row			third row			fourth row	
		left	center	right	left	center	right	left	right
0 — up to 10 kg (0–9 months)	X	X	X	X	X	X	X	X	X
0+ — up to 13 kg (0–2 years)	X	X	X	X	UF	UF	UF	UF	UF
I — 9–10 kg (9 months — 4 years)	X	X	X	X	UF	UF	UF	UF	UF
II–III — 15–36 kg (4–12 years)	X	X	X	X	UF	UF	UF	UF	UF

X — seat not suitable for the "universal" child restraint system installation.
UF — seat suitable for installation of the "universal" child restraint system in the direction of vehicle travel.

Weight group	Seats		
	Front passenger seat	Rear side seat	Rear center seat
	330365, 374195, 390945, 390995	390945, 390995	390945, 390995
0 — up to 10 kg (0–9 months)	X	X	X
0+ — up to 13 kg (0–2 years)	X	X	X
I — 9–10 kg (9 months — 4 years)	X	X	X
II–III — 15–36 kg (4–12 years)	X	X	X

X — seat unsuitable for children of this weight category

Safety Belts

Remember! Safety belts are efficient means to protect a driver and passengers against drastic consequences of traffic accidents.

Use of safety belts is mandatory!

Safety belts are designed for individual use by drivers and adults taller than 144 cm and weighing at least 36 kg.

Vehicle seats are equipped with safety belts. Driver's and front passenger's safety belts are of diagonally-waist type, with a retracting device (Fig. 3.7).

Safety belts in UAZ-220695, UAZ-220695-04, UAZ-396295, UAZ-390995-04, and UAZ-374195-05 on seats installed towards vehicle travel direction are of diagonally-waist type with retraction devices, and on seats installed against travel direction — of waist type with retraction devices (Fig. 3.8, 3.9).

Safety belts in UAZ-390995, and UAZ-390945 on seats installed towards vehicle travel direction are of diagonally-waist type with retraction devices, and on the middle seat - of waist type with a retraction device (Fig. 3.10).

To fasten safety belt, take the belt buckle and, without twisting the belt, insert the buckle into lock 2 until it clicks. To unfasten the belt, press button 3.

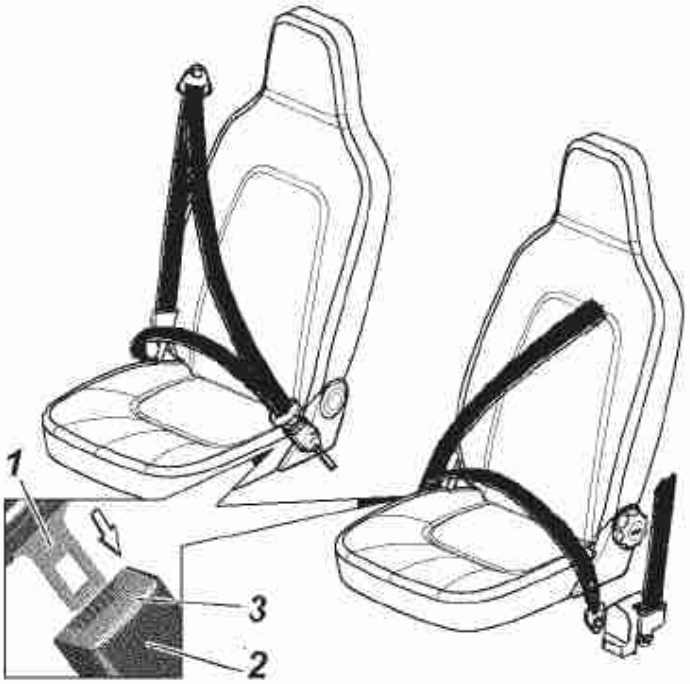


Fig. 3.7. Safety belts:
1 — latch plate; 2 — lock;
3 — lock button

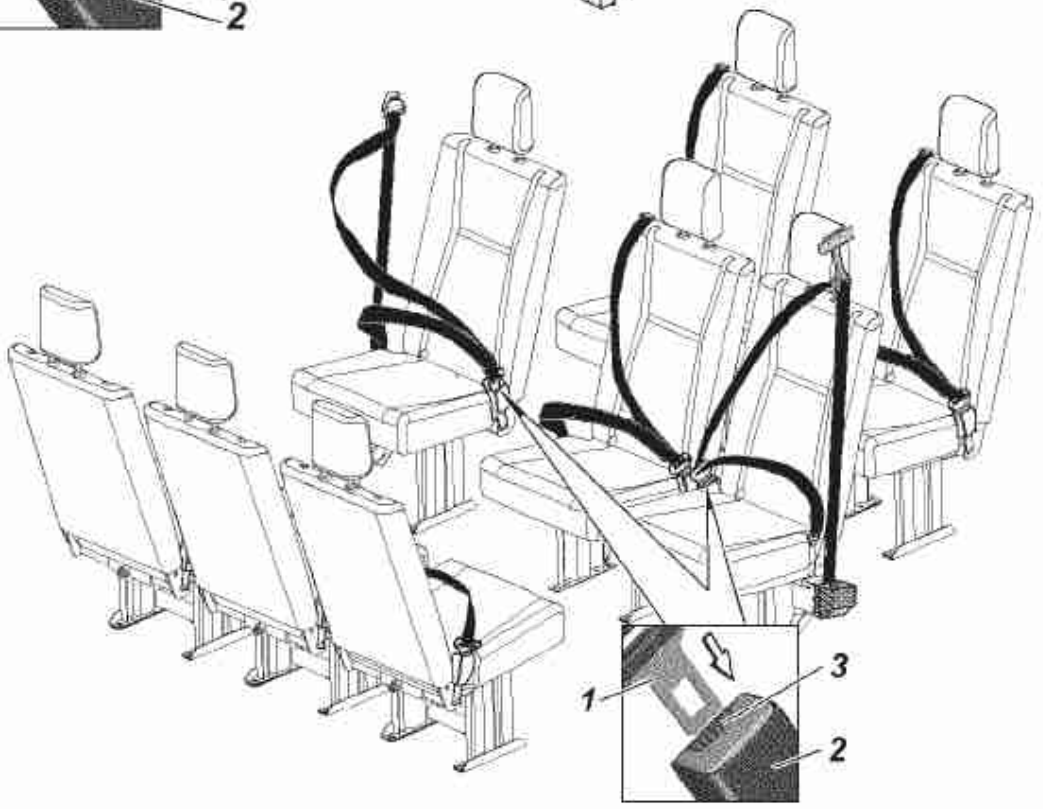


Fig. 3.8. UAZ-220695 saloon safety belts: 1 — latch plate; 2 — lock; 3 — lock button

Keep the belt straps and buckles clean. If they become dirty, clean them it with an alkali-free soap solution.

Protect the straps from contact with sharp edges.

We recommend to ensure protection against exposure to direct sunlight.

In order to clean buckles from dust, blow it with compressed air at least once a year.

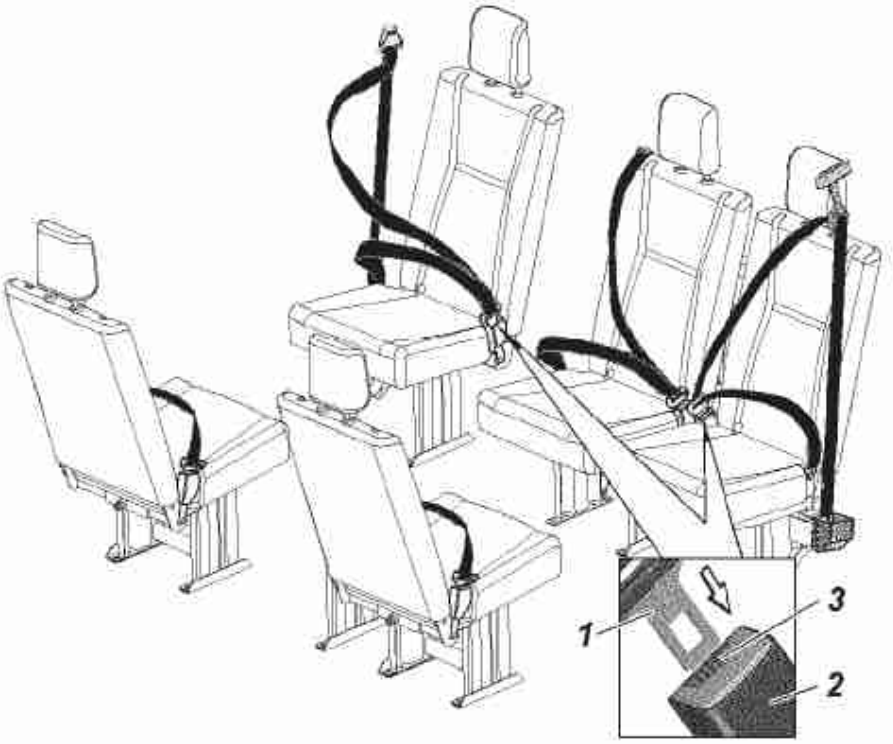


Fig. 3.9. UAZ-390995-04 saloon safety belts:
1 — latch plate; 2 — lock; 3 — lock button

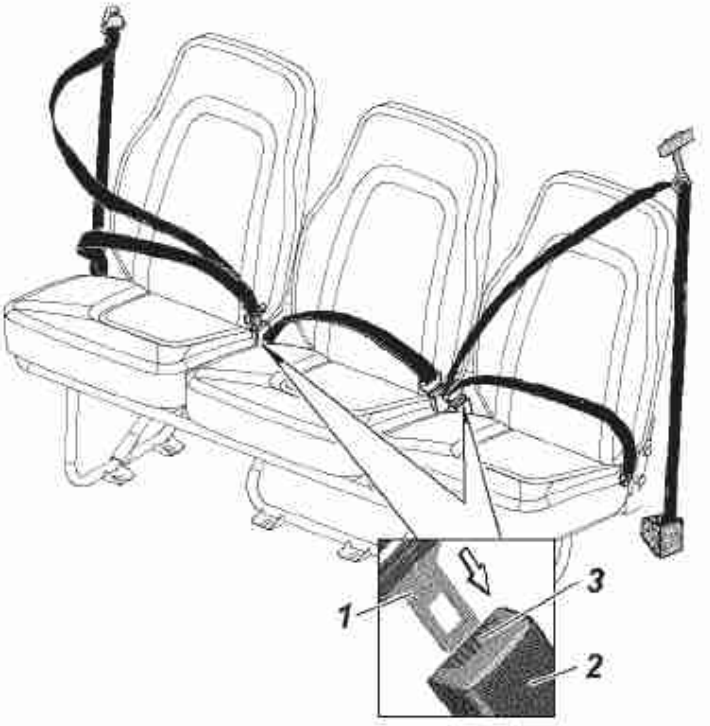


Fig. 3.10. UAZ-390995 and UAZ-390945 saloon safety belts:
1 — latch plate; 2 — lock; 3 — lock button

It is forbidden to:

- twist the strap, fold it lengthwise or allow its excessive slackness;
- iron the straps;
- fasten a child sitting on the knees of a passenger;
- make any changes in the belt design.

Safety belts must be replaced if they have scuff marks, damages or after critical load impacts as a result of a traffic accident.

Replacement of safety belts must be performed only in the authorized service shops of UAZ PJSC (addresses of the authorized service shops are listed in the service book).

UAZ PJSC is not responsible for possible injures resulting from, for example, traffic accidents, as well as for any other damage caused by operation rules violation or unauthorized replacement of safety belts.

Bodyshell (Cab) Ventilation

Driver's cabs are ventilated by means of a ventilation hatch in the front middle, a hatch cover, baffles in the heater distributive pipes, as well as rotating vent windows and down windows in cab doors. For more efficient ventilation a cab heater fan can be used; turn it on by switch 10 (Fig. 3.3) with heating system valve 15 (Fig. 3.11) closed.

It is recommended to switch the cab (saloon) fan on when driving on dusty roads. At that, the front ventilation hatch cover shall be open, and the rotating vent windows and down windows in cab doors — closed.

Fresh air comes into passenger (medical) cab via rotating vent side windows, as well as via a saloon heater shroud, if the fan is on by switch 11 (Fig. 3.3), and heat exchanger valve 15 (Fig. 3.11) is closed.

Extracting ventilation via louvers in the front and rear parts of the bodyshell side panels is provided for the cargo compartment.

Bodyshell (Cab) Heating

Cab heater with heat exchanger 13 (Fig. 3.11) is designated for driver's cab and windshield heating.

Cab heater with heat exchanger 3 (Fig. 3.11) is used to heat passenger (medical) cabs of UAZ-396295, UAZ-390995, and UAZ-220695 vehicles. UAZ-390945 vehicle is fitted with a heater depending on its configuration.

Switch on heaters by opening valve 15 (Fig. 3.11) of the heating system using draw bar handle 16 (Fig. 3.1), and, if available, switch on electric motor of 2+ heater pump (Fig. 3.11) by switch 11 (Fig. 3.3).

Heater fan electric motors are turned on and off by switches 10 and 11 (Fig. 3.3).

Coolant temperature in the engine cooling system shall be at least 80°C to ensure normal heater operation.

Use a winter front supplied with the vehicle in case of low ambient temperatures. The winter front is installed to the radiator grille using screws.

Monitor coolant temperature in the engine cooling system and use the winter front shutter to adjust it.

When draining coolant from the engine cooling system, check that it is also drained from the heating system via plug 17 (Fig. 3.11), with heating system valve 15 opened. This plug is accessible from beneath the vehicle at the front.

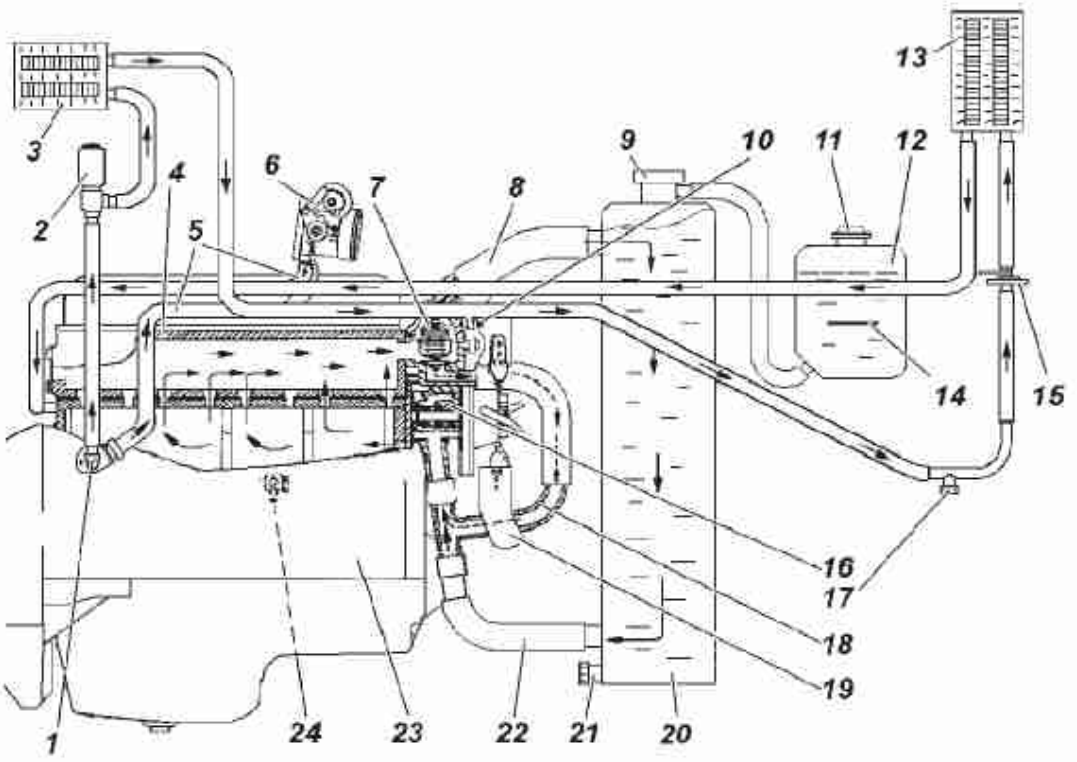


Fig. 3.11. Engine cooling and bodyshell heating system diagram:
1 — fitting for coolant supply into the heater; 2 — electric motor w/pump; 3 — cab heater heat exchanger; 4 — cylinder block head; 5 — throttling device heating hoses; 6 — throttling device; 7 — two-valve thermostat; 8 — radiator inlet hose; 9 — radiator cap; 10 — coolant temperature sensor; 11 — cap; 12 — expansion tank; 13 — cab heater radiator; 14 — "min" mark; 15 — heating system valve; 16 — pump w/impeller; 17 — heater drain plug; 18 — connecting hose; 19 — fan; 20 — radiator; 21 — radiator drain plug; 22 — radiator outlet hose; 23 — cylinder block; 24 — cylinder block drain cock (or plug) (on the left engine side)

Depending on specifications two standard barrows can be mounted in the medical cab of the vehicle bodyshell.

Four foldable brackets on side panels of the medical cab, and holders for two hanging belts on the roof are provided for standard barrows fixation.

Accompanying persons, as well as patients able to walk unaided, take seats at the right part of the cab: two in the direction of travel, and one against the travel direction.

Guides allowing barrow movement along the bodyshell are installed on the floor to ease barrow handling.

Transporting of Patients

UAZ-396295 vehicle bodyshell allows transportation of 4 to 6 persons (not including the driver) in the following arrangements:

Arrangement with barrows

On seats for accompanying persons ..... 1 or 3 persons
In the driver's cab ..... 1 person
On barrows ..... 2 persons

Arrangement without barrows

On seats for accompanying persons ..... 1 or 3 persons
In the driver's cab ..... 1 person

Fig. 3.12. Hanging belt installation

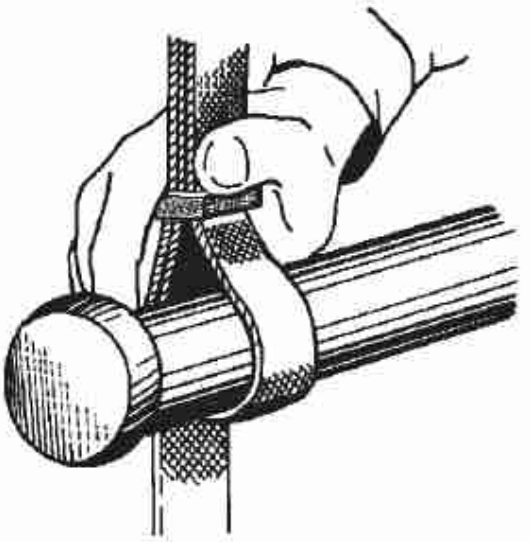


Fig. 3.13. Barrow handles fixing with the pressing frame

Prepare the vehicle for patients receipt before departure.

Carefully check the reliability of barrow suspension units, places of brackets fixation to side panels, their opening and closing, condition of hanging belts stitching and presence of belt loops, attaching points between holders and braces for belts and the ceiling.

Install hanging belts (Fig. 3.12) after checking the equipment and fixtures.

Remove all barrows when transporting seated patients. Tie folded barrows in pairs with belts and lay them along the left side of the medical cab.

Check the reliability of back door steps.

Barrows Hanging

Barrows with patients shall be hanged inside the bodyshell as follows: first, fix top barrows, then install lower barrows.

Install handles of one barrow beam onto foldable brackets, while hanging the other beam onto belt loops, dangling from the ceiling, then lock the bracket and tighten belt loops using the pressing bar (Fig. 3.13).

Be careful when transporting patients, start smoothly, and avoid hard braking.

Windshield Wiper and Washer

The applied windshield wiper is two-speed, electrically driven.

To ease manual washing of the windshield, wiper blades arms must be fixed away from the windshield.

To extend the screen wipers and blades thereof, do not allow the blades operation on dry glass and prevent ingress of fuel and oil onto the blade rubber.

Replace wiper blades or their rubber edges after 18-24 months of operation, or as necessary.

The applied washer is electrically driven, designed for fast windshield wiping.

Fill the removable tank with clean water in summer or non-freezing liquid in winter. The tank is installed at the right side beneath the instrument panel.

Adjust water jet direction by changing sprinkler balls positions using a needle inserted in the channel (supply hole) of the balls. If the sprinkler

gets clogged, remove it after extracting the clamp and detaching the pipe, and blow it with compressed air.

To avoid failure of the washer pumps, check the water level in the reservoir; 20 mm from the bottom is the lowest level permitted.

Do not keep washer reservoirs turned ON for more than 10 sec.

Chapter 4. VEHICLE PREPARATION AFTER BUYING

Dealers must sell the vehicle only after pre-sale preparations, specified in the service book.

If a vehicle is ferried to the selling point from the plant, works described in "Daily Maintenance" section shall be completed.

Chapter 5. NEW VEHICLE RUNNING-IN

The vehicle long-term and fail-safe service life depends greatly on the run-in of its parts during the initial service period.

The running-in distance is 2500 km.

During the running-in period, observe the following rules:

1. Avoid high driving speeds and maximum crankshaft rpm (engine crankshaft rpm shall not exceed 3/4 of the rated value), change gears in due time, depending on road and traffic conditions, comparing the engine rpm with the driving speed.

2. Vehicle loading shall not exceed 50 % of the maximum value during the running-in period.

3. Do not drive along tough roads (with deep mud, sand, steeps, etc.).

4. Do not haul a trailer.

5. Do not change oils filled in the engine and units at the manufacturing plant.

6. Check and adjust the drive belts tension in the auxiliary units, if necessary, as they reach the maximum stretch during the running-in period.

7. Check temperature of wheel hubs and in case of raised temperature, loosen the tightness of bearings.

8. Check condition of all attachments and piping connections; eliminate leakages of oils, fuel, coolant and hydraulic fluid, if any.

9. The scope of the vehicle maintenance is specified in the service book.

Chapter 6. ENGINE START AND STOP

GENERAL PROVISIONS

Before starting the engine, check for the coolant in the engine cooling system, fuel, and oil level in the engine crankcase.

Move the gearshift lever in a neutral position.

Release the ignition key immediately after the engine starts. The key returns to position I automatically (Fig. 3.4). Warm up the engine coolant to at least 60°C.

Do not drive with a cold engine.

It is strictly forbidden to increase the crankshaft rpm to accelerate the engine warming-up process.

ENGINE START

Cold starting at temperature of -20°C and above

ATTENTION! *To ensure reliable engine start at below-zero temperatures, the engine oil must be of proper viscosity grade. If the engine oil viscosity grade fails to ensure reliable start at the given below-zero ambient temperature, heat the oil up using steam, hot air etc.*

1. Turn on the ignition to activate the electric fuel pump, which can be heard while the engine is off.

2. If the engine is to be started after a prolonged stop, it is recommended to wait until the electric fuel pump is switched off (about 5 seconds).

3. The system functions correctly, a malfunction indicator lamp (on the instrument panel) switches on, and goes off after the engine starts. If the malfunction indicator lamp continues glowing, it is required to detect and remove a malfunction (refer to "Diagnostics").

ATTENTION! *If the vehicle has malfunctioning systems (the malfunction indicator lamp continuously glows), it can cause the failure of the engine catalytic converter, engine overheat or destruction (knocking).*

4. Press the clutch pedal until stop.

5. Switch on the starter motor.

6. Release the key after starting the engine (turn off the starter).

Try to start the engine not earlier than 15 - 20 seconds after the first attempt.

It is not recommended to press the throttle pedal when starting the engine.

After starting the engine, its system will automatically set the fast idle speed to warm up the engine, and will gradually reduce it to the minimum as the engine warms up.

If the engine does not start after the third attempt, stop the starting, detect and remove a malfunction.

Cold starting at temperature below -20°C

In order to ease the cold engine start at low temperatures, a preliminary warm up is required (by steam, hot air, etc.).

Further operations are the same as in case of starting from cold at -20°C and above.

Hot Engine Start

The sequence of operations is the same as in case of starting from cold at -20°C and above.

If the engine does not start after the third attempt, press the throttle pedal as far as it can go and turn on the starter for 2-3 seconds. The control unit will perform "Scavenging of the Engine Cylinders Mode" function and then retry to start the engine.

ENGINE STOP

In order to stop the engine, turn the ignition key to position "0". Before shutting down the engine, let it run for 1-2 minutes at low rpm.

Chapter 7. VEHICLE DRIVING IN DIFFERENT ROAD, WEATHER AND CLIMATIC CONDITIONS

The manufacturer (UAZ PJSC) cares about its customers and hopes for thoughtful use of its products.

While supporting the all-Russian program of road transport accident reduction, the Manufacturer recommends that the maximum speed of **90 km/hr** provided in the Traffic Rules for Public Roads not be exceeded.

Remember that a vehicle's control, stability and braking performance depend greatly on tires/traction, therefore select a driving speed according to traffic flow, weather and road conditions, pavement condition, and vehicle and cargo features. In any case, the driving speed must ensure the driver's continuous control over the vehicle to observe safety requirements and Traffic Rules.

The vehicle operation and service life depend greatly on driving techniques. Driving correctly, you will ensure the motor vehicle motion

with high average speed and low fuel consumption over difficult road sections. **We recommend to start off at level stretches of hard-surface roads or downward in the second gear. In all other cases, start the motion in the first gear.**

Change gears and engage the front axle when the clutch is disengaged:

- disengage the clutch fast by pressing the clutch pedal as far as it can go;
- engage the clutch smoothly, avoiding both quick release of the clutch pedal which results in jerking motion of the vehicle, and slow engagement of the clutch with prolonged slipping;
- do not keep the clutch disengaged on a stationary vehicle (while waiting at railway crossings, traffic lights, etc.) with the gear engaged and the engine running. Use the neutral gear of the gearbox and the fully engaged clutch;
- do not rest your foot on the clutch pedal when the vehicle moves;
- do not use clutch slipping for keeping the vehicle on inclines.

Put in the gears smoothly and without jerks. If it is impossible to put in the right gear when driving away from standstill, then slightly release the clutch pedal and try to disengage the clutch and engage the gear.

Synchronizers in the gearbox allow gear shifting without double clutch shift. However, to accelerate gear shifting and increase to synchronizers service life, it is recommended to use double clutch shift with brief accelerator pressing when shifting gears down.

The reverse gear in the gearbox shall be engaged after complete vehicle stop only. Do not rest your foot on the clutch pedal while driving because it leads to partial clutch disengagement and disk slippage. On a slippery road, drive steadily at low speed.

Release the throttle pedal completely when braking with the engine.

Brake the vehicle smoothly by gradually pressing the braking pedal. Any braking promotes the wear of the tires and the fuel consumption. Avoid the slipping of the wheels when braking, as it increases the braking path and wear of the tires. Besides, sharp and hard braking can result in skidding of the vehicle.

When driving the vehicle off the road surfaces (sand, mud, snow, etc.), or at slippery roads, steep inclines (more than 15°) and other difficult-to-drive road sections, do not overload the engine. In such conditions, engage the front axle, and prior to motion under extremely severe conditions engage

also the speed reduction gear in the transfer case. Engage the front axle while the motor vehicle is moving, and engage the speed reduction gear in the transfer case after a complete stop of the vehicle only.

Overcoming steep inclines and declines. When driving on roads with steep inclines and declines, a driver shall be very careful and have quick reflexes. First determine an uphill gradient and put in the required gear, which will ensure a required rim pull without shifting the gear. In order to overcome a steep incline, use the reduction gear of the transfer case and the first gear of the gearbox. Overcome the steep inclines without stops and turnings as far as possible. Overcome the short steep inclines with the convenient access and even road surface by speeding up without using the reduction gear of the transfer case and by shifting the gearbox to the second or third gear depending on the uphill gradient. If for some reason, it is impossible to overcome the incline, then take all precautions and slowly descend by shifting to the reverse gear. Descend gradually, do not speed up the vehicle and do not disengage the clutch. When overcoming the steep declines, take measures to ensure safe descending. Before overcoming a long decline (more than 50 m), determine its steepness, shift the gearbox and transfer case into the required gears to overcome it. Such declines are overcome by braking with the engine.

ATTENTION! *It is forbidden to overcome steep declines with disengaged gears of the gearbox and transfer case or with the clutch disengaged.*

Avoid engine overspeed when moving down the steep, reduce the vehicle speed by periodic braking.

Overcome ditches, side ditches and trenches at low speed with the front axle engaged in the direction perpendicular to a decline with regard to the vehicle dimensions defining its cross-country capability. Do not overcome an obstacle with a rush, if an impact against the wheels is possible.

When overcoming the ditches and trenches, consider the possibility of getting stuck due to the wheel slip and vehicle cross-axling.

Driving along muddy country roads and graded clay and gumbo roads. When driving along clay and gumbo roads after heavy rain, the vehicle can slip off the road. Be careful when choosing a direction of motion. In order to prevent side-wise skidding, choose relatively level grounds while trying to move along rut roads, if possible. It is very

difficult to steer the vehicle on extremely wet graded roads with steep grades and deep trenches. On these roads, drive carefully on the crest of the corrugation and at low speed.

Overcome marsh-ridden sections by driving along the straight line without sharp turns and stops. Drive smoothly and without jerks. Move with the engaged front axle and reduction gear of the transfer case, using the gear of the gearbox which will provide a required rim pull without slipping. In order to prevent the wheels from slipping and losing the adhesion with the turf, turn smoothly with a large radius, do not reduce the speed. Do not drive along the track made by a vehicle moving ahead.

When overcoming sandy sections, drive smoothly without jerks and stops. Turn smoothly and with a large radius. Switch on the highest possible gear and engage the front axle, in order to overcome sand drifts and short sand inclines in a rush. Avoid slipping of the wheels. Determine road conditions preliminarily and switch on a required gear which will provide a required rim pull.

Overcome fords with great care. The vehicle can overcome a 500 mm deep ford with a hard bottom at low speed. Before overcoming a ford, check its bottom. Make sure that there are no deep pits, big stones, swampy grounds, choose and check the ground where the vehicle will enter the water and go out of the water, switch off the fog lamps.

Overcome fords slowly, without making waves in front of the vehicle, in the first or second gear of the gearbox, engaging the front axle and the reduction gear of the transfer case.

Avoid maneuvering and sharp turns.

After fording, as soon as possible, but not later than on this day, check oil in all units. Change oil in a unit where the water is detected. There is some water in the oil, if its color is changed. Lubricate all grease fittings of the chassis until the fresh grease appears. After every fording, partly engage the clutch and partly apply the brakes for several times in order to dry the clutch facings and brake shoe linings.

If the engine stops when fording, try two-three times to restart the engine using the starter. If the engine fails to start, the motor vehicle shall be immediately removed from the water by any possible means. If some water penetrated into the motor vehicle units, it is not recommended to drive the vehicle after the motor vehicle removal from the water. Tow the motor vehicle to a place where maintenance is feasible.

The vehicle can move along virgin snow of 350 mm in depth. Steer the vehicle in the same manner, as when moving on swampy grounds. When driving on friable snow, apply the same rules, as when driving on sand surfaces.

Chapter 8. VEHICLE TOWING

Towing hooks are provided on the front of the vehicle's frame, and a towing shackle is installed at the rear. Vehicles shall be towed smoothly, without jerks.

Strictly follow requirements listed in the Traffic Rules when towing.

If the steering system or brake system do not work properly, further motor vehicle driving or towing with a tow-rope is not allowed. In this case you shall use two-wheel vehicle towing or a tow truck.

Trailer towing is allowed only in the presence of a ball-type towing hitch, properly certified as a part of the road-train as per the established procedure.

Chapter 9. VEHICLE MAINTENANCE

The motor vehicle maintenance extent and frequency are specified in the service book.

This section describes techniques of motor vehicle care and its units adjustment, and also works to be performed on a regular basis in between maintenance operations, stipulated by service book cards.

Tightening torques of the main threaded couplings are shown in Appendix 2 hereof.

DAILY MAINTENANCE

1. Check visually the motor vehicle complete set, condition of the bodyshell, canvas top, glasses, rear-view mirrors, appearance package, registration plates, painting, door locks, wheels, and tires. Eliminate any revealed defects.

Inspect visually the parking space to make sure no leaks of fuel, oil, cooling and braking fluids are present. Eliminate any revealed defects.

Check and replenish the coolant, oil in the engine housing, braking fluid and fuel to the required amount.

2. Check functioning of the steering system, brake systems, illumination devices, light and sound alarm, windscreen wiper. Eliminate any revealed defects.

3. Fill the windshield washer tank. Water is allowed for use in warm season.

4. If the vehicle was operated in extremely dusty conditions or crossed fords and country road sections covered with liquid mud, check the condition of a filter element of the engine air filter and replace it, if necessary.

5. After a journey, wash the motor vehicle if operated on dirty or dusty roads.

6. At least once a week, check and bring the tire pressure into compliance.

VEHICLE MAINTENANCE EVERY 500 KM

After the first 500 km, tighten steering mechanism housing fixtures, leaf spring U-bolt nuts, and wheel nuts of a new vehicle.

SEASONAL MAINTENANCE

Seasonal maintenance shall be performed twice a year (in spring and autumn) and, if possible, combined with the next maintenance in accordance with cards of the service book.

Prior to summer operation

1. Drain sediments from fuel tanks.

2. Switch the windshield wiper for 15 - 20 minutes with blades away from the glass.

3. Check braking system efficiency and proportioning valve operability.

4. Replace oils in units with summer (or all-season) sorts listed in Appendix 3.

Prior to winter operation

1. Check density of fluid in the engine cooling system and bring to the standard value (1.075–1.085 g/cm^3 at 20°C), if necessary.

2. If water is poured into the washer tank, drain the water. Pour in the low-freezing-point fluid for the windshield washer.

3. Check operation of the bodyshell heating and ventilation system. Eliminate any defects.

4. Wash fuel tanks prior to the winter season of operation (or after 30,000 km).

5. Check braking system efficiency and proportioning valve operability.

6. Switch the windshield wiper for 15 - 20 minutes with blades away from the glass.

7. Replace oils in units with winter sorts listed in Appendix 3.

Engine Suspension

In operation, check tightening of threaded joints of the front and rear engine suspensions (see Appendix 2) and condition of the struts. No delamination or breakage of the engine struts is allowed.

Engine Cylinder Head

Cylinder head bolts tightening is not required during operation. Perform the tightening only when the engine is cold, if necessary. In order to provide a tight and even contact of the cylinder head bolt with the gasket, perform the tightening in a sequence shown in Fig. 9.1, in two steps. Tighten the bolts evenly using the torque wrench (refer to Appendix 2).

In case of increased oil consumption due to burn-out loss, pinking and surface ignition, remove the cylinder head and clean surface of the combustion chambers, valve discs and piston tops off soot deposition.

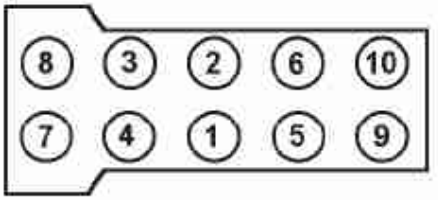


Fig. 9.1. Sequence of the cylinder head fastening bolts tightening

Engine Gas-Distribution Mechanism

The camshafts have a chain double-stage drive. The chains are pulled by hydraulic tensioners.

ATTENTION! *Do not take the hydraulic tensioner out of the chain cover to prevent disengagement of the piston with the casing caused by the wrap spring. Otherwise assembly in a special fixture will be required.*

The valves are driven from the camshafts directly via the hydraulic pushers. Where the hydraulic pushers are being used, no clearance adjustment is required.

Engine Lubrication System

If there exist faults in the lubrication system, the engine operation must be stopped immediately.

ATTENTION! *The Manufacturer installs onto the ZMZ-40911 engine a smaller oil filter which must be replaced during the first maintenance*

(when the first 2,500 km are covered) with one of the following filters: 2101C-1012005-NK-2, 2105C-1012005-NK-2 manufactured by KOLAN, or 409.1012005 manufactured by BIG-Filter, LLC.

For oil cooling, the lubrication system comprises the oil cooler connecting into the cooling process automatically using the thermal valve.

Regularly check the oil level in the housing and fill it up, as required. The oil level shall be checked before starting the engine. In case the check up is done after the engine stop, wait for 15 minutes to let the oil run down into the housing. Place the vehicle on a horizontal site. The oil level shall be between "0" and "П" oil level gauge marks 9 (Fig. 9.2). In case of frequent off-road trips keep it close to "П" mark, but do not exceed it. The volume of oil to be added to the engine between "0" and "П" marks equals 1 liter.

Use recommended oil brands.

Mixing engine oils of different grades and from different manufacturers is forbidden! If the engine oil of another grade or manufacturer is to be poured, make sure you have flushed the lubrication system with flushing oil. Flushing oil shall be selected as required by the engine oil manufacturer.

Replace the oil filter at each engine oil change. Drain used oil from the engine housing immediately after a trip while it is still hot. In this case, the oil flows out quickly and completely.

Remove oil filter 11 (see Fig. 9.3) by turning it counter-clockwise. When installing a new filter, make sure the rubber O-ring is in proper condition and lubricate it with the engine oil, turn the filter until the O-ring touches the crankcase plane and then tighten the filter another 3/4 of turn. Make sure no oil leak occurs.

With the warm engine and the intact lubrication system, the critical oil pressure indication lamp may be on at idle, but it shall go off immediately after increasing the engine rpm.

It is recommended to flush the engine lubrication system after each two oil changes. For that purpose, drain the used oil, fill in special flushing oil 3-5 mm over the "O" mark on the oil level indicator and let the engine run for 10 minutes. Then drain the flushing oil, replace the oil filter and pour in clean engine oil. If the flushing oil is not available, use pure engine oil for purging.

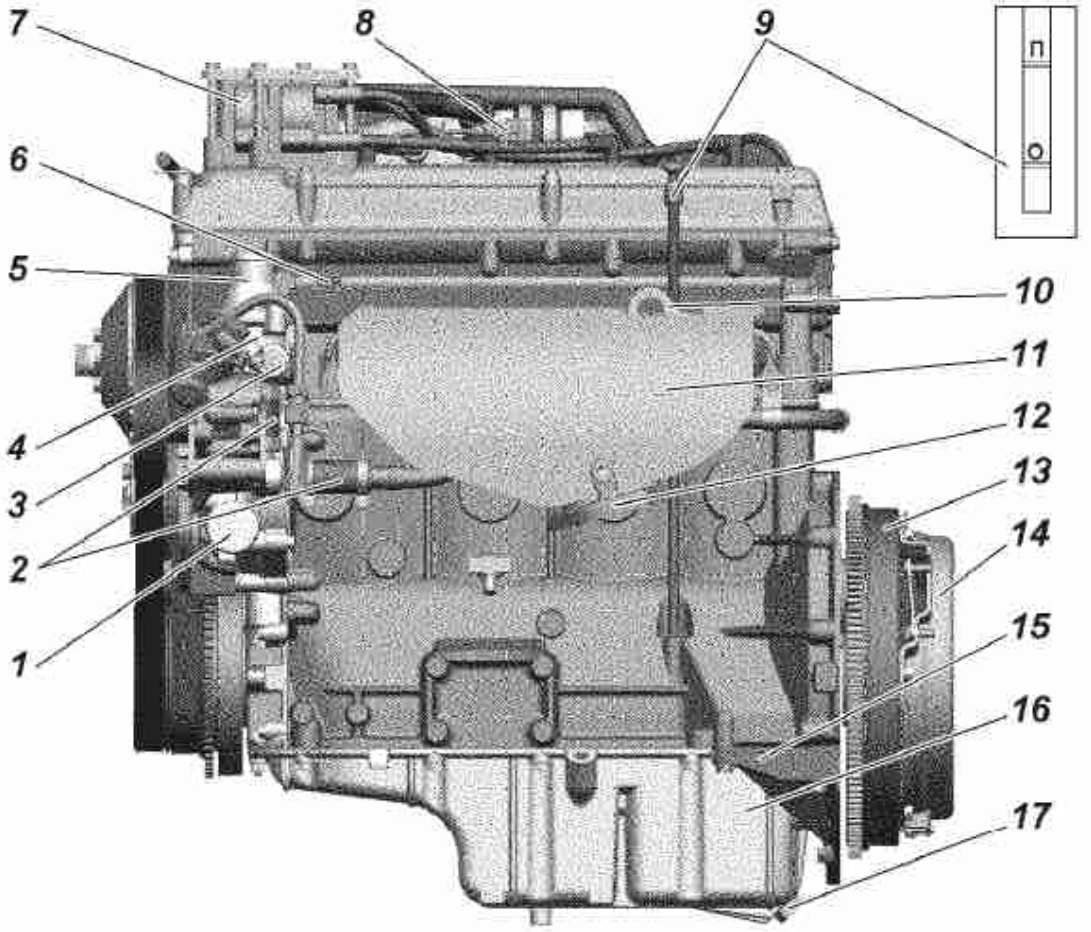


Fig. 9.2. Engine ZMZ-40911 (left side view):
1 — coolant from radiator to water pump supply pipe; 2 — connection hoses; 3 — control unit coolant temperature sensor; 4 — thermostat housing; 5 — coolant branch pipe from thermostat to radiator; 6 — critically low oil pressure sensor; 7 — ignition coils; 8 — crankshaft position sensor connection; 9 — oil level indicator; 10 — engine elevation rear bracket; 11 — exhaust manifold screen; 12 — exhaust manifold ; 13 — flywheel; 14 — clutch; 15 — clutch charger booster; 16 — oil charger; 17 — oil purge plug.

Engine Housing Ventilation System

When servicing the ventilation system, remove valve cap (Fig. 9.4), main and auxiliary ventilation hoses, and clean all parts. Clean separated oil drain orifices in the oil baffle, orifices in the valve cap ventilation hoses, receiver, and throttle body. The oil baffle shall be washed without dismantling it from the valves cap. Ensure connections tightness during assembly.

ATTENTION! *The engine may not be operated with the non-tight breather system and the oil filler opened. This results in increased escape of oil with crankcase gases, and contamination of the environment. To prevent the breather system depressurization, you must close the oil filler cap tight as far as it can go, and install the oil level indicator against stop.*

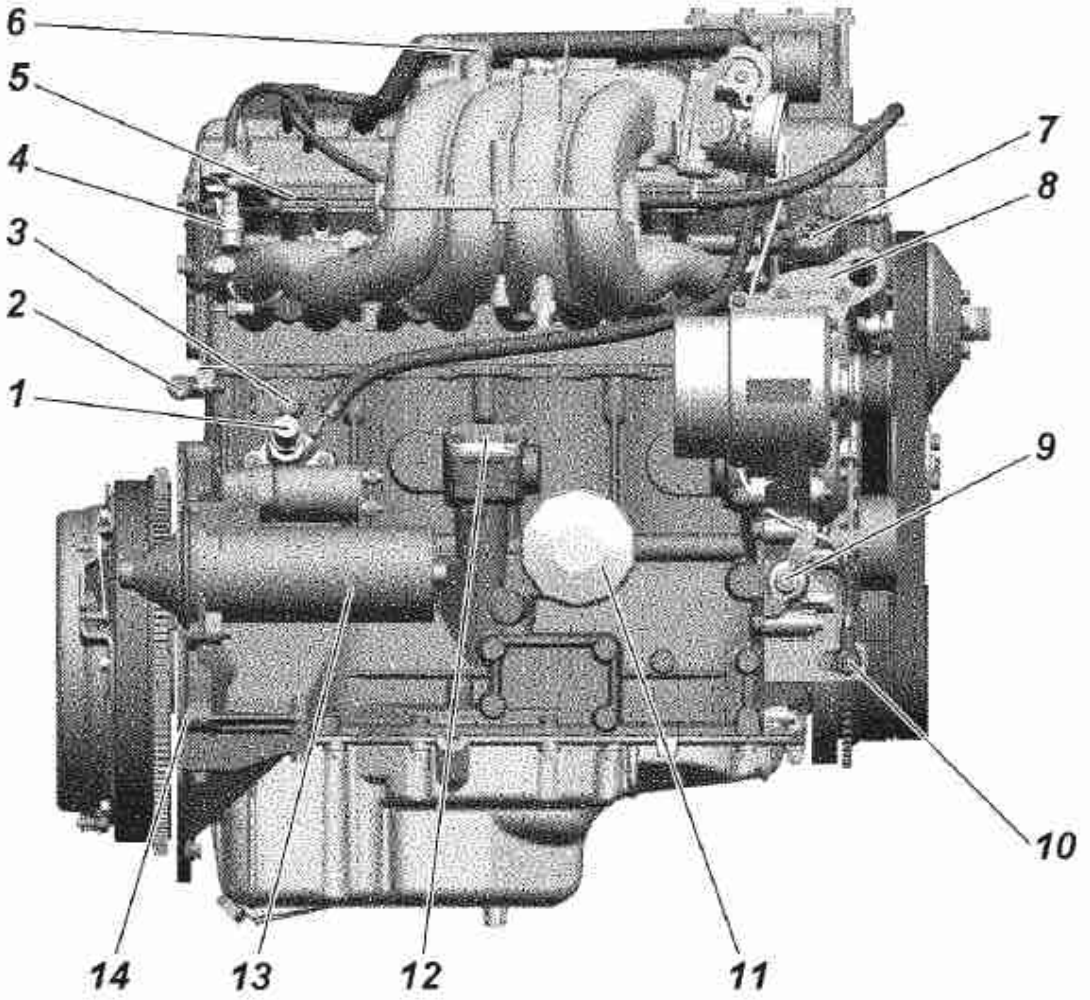


Fig. 9.3. Engine ZMZ-40911 (right side view):
1- coolant to heater branch pipe; 2 — heater coolant discharge tube; 3 — pinking sensor; 4 — proportioning valve; 5 — fuel rail with nozzles; 6 — absolute pressure sensor; 7 — upper hydraulic tensioner cap; 8 — engine elevation front bracket; 9 — lower hydraulic tensioner cap; 10 — crankshaft position (synchronization) sensor; 11 — oil filter; 12 — oil pump drive cap; 13 — starter motor; 14 — gear installation pin

Engine Cooling System

ATTENTION! *The coolant is poisonous. Keep it in a tightly closed container. Follow these rules when handling the coolant:*

- *avoid any mouth contact with the fluid;*
- *do not let the fluid dry out on the skin; wash it off immediately with a soap and warm water;*
- *flush the spilled fluid with water, air the room;*
- *take off the clothes spilled with the fluid, dry it outside the room and wash.*

Be careful when opening the radiator cap of the engine cooling system to avoid scalding with vapour.

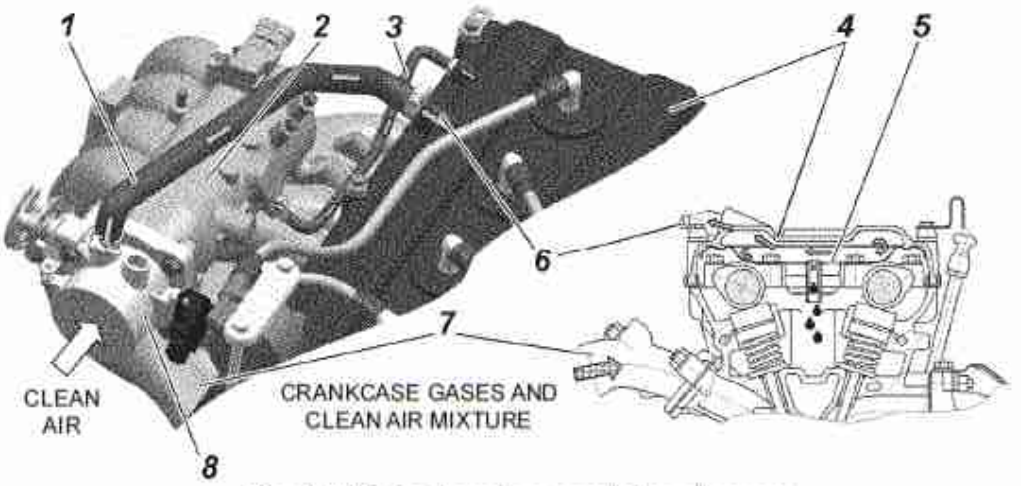


Fig. 9.4. Engine housing ventilation diagram:
1 — main ventilation circuit; 2 — receiver 3 — short ventilation circuit; 4 — valve cap; 5 — oil baffle; 6 — crankcase gases deflector; 7 — inlet pipe; 8 — throttle pipe

TOSOL-A40M, OZH-40 Lena or OZH-40 TOSOL-TS low-freezing fluids are used as coolants.

TOSOL-A65M, OZH-65 Lena or OZH-65 TOSOL-TS low-freezing fluids are used as coolants at the ambient air temperature below minus 40°C.

The coolant operating temperature shall be within 80°–105°C. A short-time (maximum of 5 minutes) engine run is allowed at the cooling fluid temperature rise to 109°C.

If the coolant overheat warning lamp lights up, identify and eliminate the reason causing overheating immediately.

Check the coolant level periodically in expansion tank 12 (Fig. 3.11). The fluid level shall be 3-4 cm above the mark "min" in tank 12. Since the cooling fluid has high thermal expansion coefficient and the cooling fluid level in the expansion tank varies significantly depending on the temperature, check the level when the system temperature is plus 15-20°C.

In case of the cooling fluid decreases in the expansion tank within a short period time or after moderate mileages (up to 500 km), check the cooling system tightness and after elimination of leaks, add the same cooling fluid into the cooler or the expansion tank.

Every three years or after every 60,000 km (depending on which happens first) purge the cooling system and refill the coolant.

The cooling system shall be flushed as follows:

- fill the system with pure water, start the engine, let it work for warming up, shut the engine down and drain water;
- repeat the above operation.

The system cannot be completely filled without starting the engine due to air in the saloon heaters and connecting hoses. Fill the system as follows:

- tighten radiator drain plug 21 (Fig. 3.11) and heater drain plug 17, close drain cock (plug) 24 of the crankcase;
- set heating system cock 15 to position "open";
- fill the coolant system with the cooling fluid to the level of 10-15 mm below the neck, and the expansion tank to the level of 3-4 cm above the mark "min";
- start the engine, add the cooling fluid to the cooler upper tank when its level decreases, and close the radiator plug;
- stop the engine, let it cool down, raise the cooling fluid level in the expansion tank to the standard, and close the expansion tank plug;
- run 2-3 cycles of the engine warm-up / cool-down, and again raise the cooling fluid level in the expansion tank to the standard.

For liquid draining from the coolant system, first open radiator plug 9, unscrew radiator draining plug 21 (Fig. 3.11) and heater draining plug 17, open cock (plug) 24 on the crankcase. For draining, set heater cock 15 control lever to position "open".

The heater pump and alternator driving belt 5 (Fig. 9.5) is pulled up by tension roller 2. For this purpose, release bolt 3 and tension the belt by turning adjusting bolt 4. Then tighten bolt 3.

Fan and steering system hydraulic pump drive belt 16 (Fig. 9.5) tension is performed by displacing pump 12 as follows: loosen bolts 13, adjust the drive belt tension by adjusting bolt 14 and moving the pump along rails. Tighten bolts 13.

Fan drive clutch. In case the clutch does not switch on and off properly, the engine can overheat. Check up to be done at a specialized UAZ workshop.

Keep the clutch surface clean.

Exhaust System

ATTENTION! *The catalyst operating temperature is between 400-800°C. The motor vehicle may not be operated if no protective screen is installed on the converter. During the motor vehicle motion and in standstill keep an eye on that the exhaust system has no contact with inflammable materials (e.g. dry grass).*

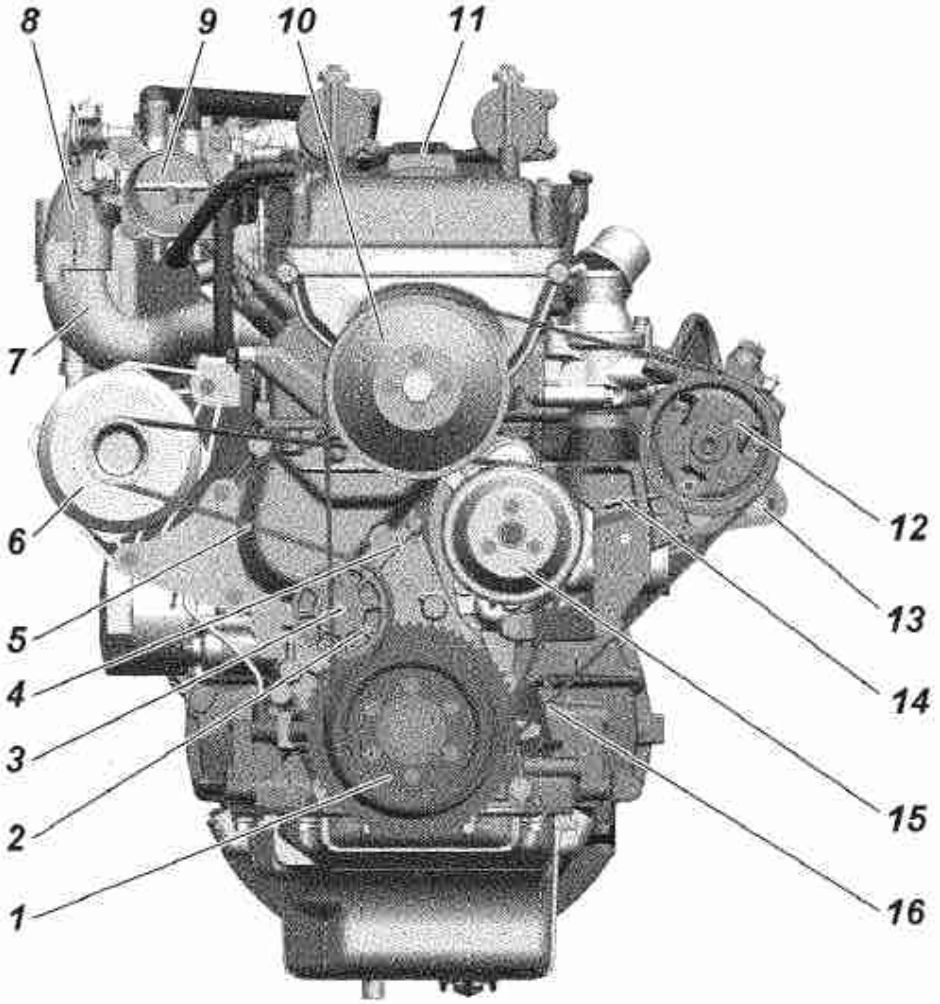


Fig. 9.5. Aggregates drive belt tension
1 — crankshaft damping pulley; 2 — tensioning roll; 3 — tensioning roll fixing bolt; 4 — adjusting bolt; 5 — water pump and alternator driving belt; 6 — alternator; 7 — inlet pipe; 8 — receiver; 9 — throttle unit with throttle position sensor; 10 — fan pulley; 11 — oil filling neck cap; 12 — power steering pump pulley; 13 — power steering pump fixing bolt; 14 — adjusting bolt; 15 — water pump pulley; 16 — fan and power steering pump drive belt

Exhaust gas leaks from the exhaust system connections fitted with gaskets are not allowed and shall be eliminated on the first occasion. Stuck nuts shall be tightened (see Appendix 2) with preliminary wetting of thread connections with special liquids or kerosene.

When the feed system or the ignition system is faulty, a lot of unburnt hydrocarbons ingress into the converter and due to this, the temperature in the converter can rise above the admissible limit and the converter will fail. So, special attention shall be paid to operation of the feed system and the ignition system. Three-cylinder-based operation of the engine is prohibited even for a short period of time.

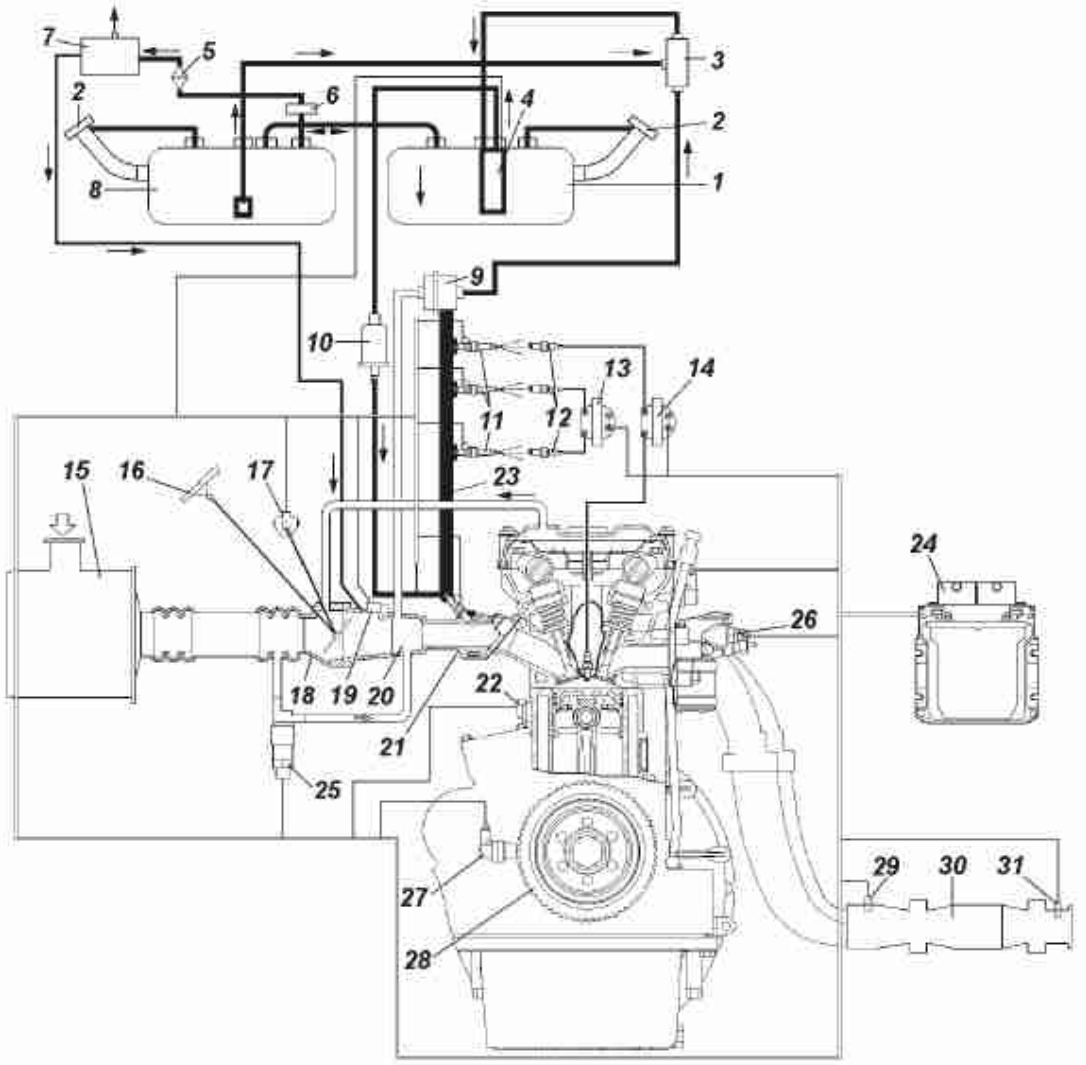


Fig. 9.6. Principal diagram: fuel and engine control system (with gasoline injection)
1 — left (main) tank; 2 — fuel tank plugs; 3 — jet pump; 4 — electric fuel pump (submersible module); 5 — fuel tank valve; 6 — separator 7 — absorber; 8 — right (additional) tank; 9 — proportioning valve; 10 — fuel fine filter; 11 — fuel nozzles; 12 — spark plugs 13 — 2nd and 3rd cylinders ignition coil; 14 — 1st and 4th cylinders ignition coil; 15 — air filter; 16 — throttle valve actuator pedal; 17 — throttle valve position sensor; 18 — throttle unit; 19 — absolute pressure sensor; 20 — inlet pipe; 21 — receiver; 22 — pinking sensor; 23 — fuel rail; 24 — engine control module; 25 — idle governor; 26 — coolant temperature sensor; 27 — crankshaft position sensor; 28 — crankshaft synchronization pulley toothed disk; 29, 31 — oxygen sensors for exhaust gases; 30 — catalyst

Gasoline Injection System with Microprocessor-Controlled Fuel Feed and Ignition (Fig. 9.6)

Precautions

1. Before disassembling and assembling any parts or cables of the steering system disconnect a mass wire from the battery.

2. DO NOT start the engine without a safe battery and ground wire connection between the engine and the bodyshell.

3. DO NOT disconnect the battery from the onboard power supply with the engine running.

4. To charge the battery from an external source disconnect the battery from the onboard power supply.

5. The control unit may not be exposed to temperatures above 80°C, e.g. in an oven drier.

6. Prior to arc welding operations, disconnect the battery wire and the control unit connector.

7. To prevent rusting of pins during vapour cleaning, do not direct the nozzle to the system components.

8. Electronic elements of the control systems use extremely low voltage and can be damaged by electrostatic charges.

ATTENTION! *For access to the fourth cylinder spark plug remove a plug on the hood rear panel.*

9. The fuel supply system from the electric fuel pump to the proportioning valve at the running engine is under pressure of 3 kgf/cm^2.

ATTENTION! *Fuel line joints cannot be loosened or tightened with the engine running or immediately after its stop.*

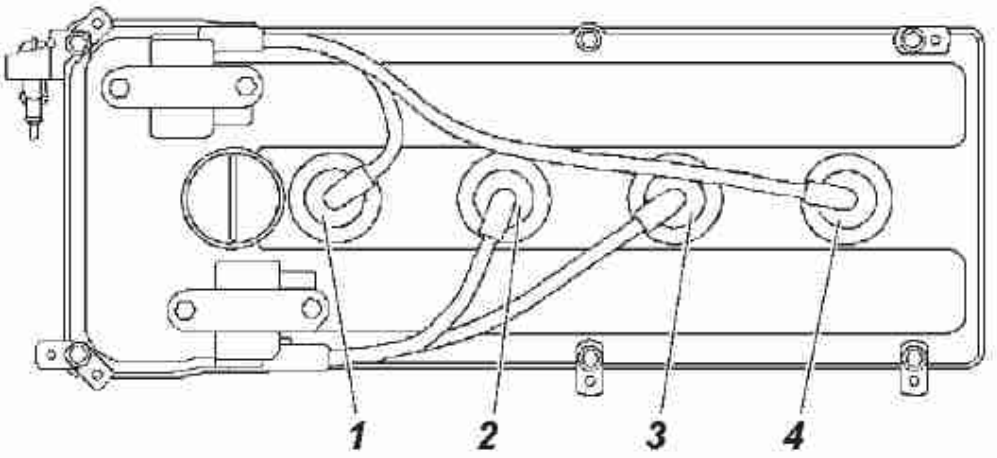


Fig. 9.7. High-voltage wires installation sequence
1, 2, 3, 4 — numbers of engine cylinders

10. The fuel pump electric motor is cooled by the passing fuel flow; thus, DO NOT turn the electric fuel pump on 'dry', when the left fuel tank is empty, to avoid its damage.

11. Do not start the engine with incorrectly installed high-voltage wires between ignition coils and spark plugs, and low-voltage wires to ignition coils.

Fuel System

ATTENTION! *The motor gasoline and its vapours are toxic and fire hazardous. Observe the following rules:*

- *observe fire safety rules;*
- *avoid any mouth contact with gasoline;*
- *do not let the fluid dry out on the skin; immediately wash it off with a soap and warm water;*
- *cover the spilled gasoline with sand or chips, brush off and dispose of them, ventilate the room;*
- *take off the clothes contaminated with gasoline, dry it outside the room, and wash it.*

ATTENTION! *Use only recommended unleaded gasoline (lead from leaded gasoline causes failure of the exhaust gas oxygen sensors and the converter).*

The fuel comes to the electric fuel pump from the left tank. The left tank is replenished from the right one, as the gasoline is consumed.

Plugs, installed at necks of the fuel tanks filling pipes, are blind and ensure tight packing.

The following is recommended due to the specified features of the fuel system design:

- when closing the fuel tank inlet necks make sure the plugs are in order, spacers are in place and integral, use adequate effort to seal the plugs;
- for partial fuelling of the motor vehicle, start from the left tank;
- monitor the fuel consumption with due account for variation of the fuel amount in both tank.

Fuel tanks. Fuel tanks maintenance includes electric fuel pump periodic flushing (left tank), fuel gauge inlet pipe filter flushing (right tank), and tanks flushing.

Drain sediments periodically.

Check from time to time the reliability of tanks fastening and, if necessary, tighten fastening bolts.

To be flushed, the fuel tanks shall be dismantled from the motor vehicle.

Electric fuel pump. Regularly check and clean fuel pump pins and connections to the onboard power supply.

Pay special attention to reliability of the ground connection.

It is not recommended to operate the motor vehicle if there is less than 5 liters of fuel in the left fuel tank.

When crossing steep climbs, there must be at least 20 liters of fuel in the right tank.

Clogging of the fuel pump strainer, final fuel filter, presence of dirt and mechanical admixtures in a fuel tank are manifested first of all in the impeded fuel pumping from the left tank into the right one, unstable engine operation at high loads, and degradation of the motor vehicle performance. If such signs arise, seek service station help in order to prevent the fuel pump failure.

The following works shall be done at the service station:

- disconnect fuel supply and return pipes;
- dismount the left fuel tank;
- dismount the submersible module;
- flush the fuel tank with clean gasoline and dry it out (e.g., wipe with a lint-free rag);
- remove the electric fuel pump intake barrel and flush it;
- flush the filter screen **(do not remove the filter screen from the electric fuel pump, otherwise the manufacturer's warranty becomes void)**;
- install the electric fuel pump into the fuel tank (pay attention to sealing ring installation, it shall be dry);

If the engine works the same after the above measures, i.e. its operation is unstable, the following **shall be done**:

1. Replace the fine fuel filter.
2. Make sure the fuel is in the main fuel tank. The minimum amount — 10 l (for checking purposes only).
3. Measure the fuel system pressure at idle:

a) at 800 rpm and at 2000...2500 rpm (about 2.6...2.7 kgf/cm^2);

b) at a sharp brief throttle opening (a surge to 3.0 kgf/cm^2);

c) at the ignition on and the engine stopped — 3.0...3.15 kgf/cm^2.

4. Check cleanliness of the jet pump nozzle.

5. Check the right fuel tank connection to the atmosphere. The drain line from the engine (proportioning valve) into the left tank shall not be squeezed.

6. Measure the fuel flow at the fuel rail drain (it shall be at least 75 l/h at the back pressure of 300-10 kPa and the power supply voltage of (13.5 ± 0.1)V). Measure via the fuel drain hose by disconnecting it from the jet pump.

If no drain or drain less than 75 l/h exists, replace the electric fuel pump.

Note. At the ambient air temperature of below 0°C, the clogging signs can be due to water presence and freezing in the feed system. If water was detected in the fuel, drain the fuel and flush the fuel tanks with pure gasoline, and replace the fine fuel filter.

Jet pump. Check from time to time tightness of the pump and connections thereof. If the fuel is not pumped from the auxiliary tank into the main one, disassemble the pump (unscrew the nozzle), flush it and purge with air.

The jet pump is fixed on the fuel hoses near the frame side member.

Leaks in couplings shall be rectified through tightening (see Appendix 2) or by replacing faulty components.

Upon completion of any fuel system **maintenance operations** related to tightening of connections, removal or replacement of parts and assemblies, the system tightness must be checked as follows:

- make sure the fueling neck plugs are screwed in tightly;
- tighten collars and screw couplings to the sealed condition;
- start the engine running idle and check the system visually. Fuel leaks or wetting of the feed system components are not allowed.

The throttle pedal actuator may require rope tensioning adjustment in the course of operation. To tension the rope, unscrew nut 3 (Fig. 9.8) and tighten nut 4.

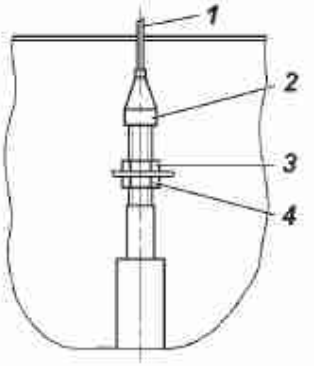


Fig. 9.8. Throttle pedal actuator adjustment
1 — wire; 2 — wire shell with adjusting end; 3, 4 — nuts

Air filter. The filter element shall be replaced after each 15,000 km of travel, as well as in case of engine power decreasing (e.g., if operated in very dusty environment).

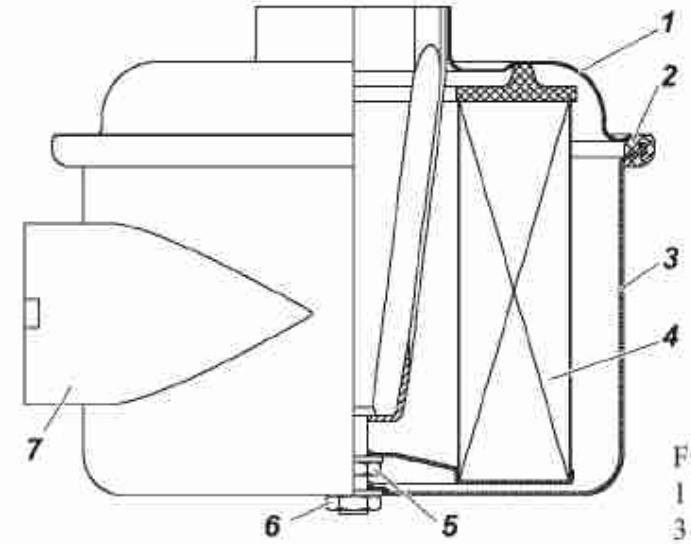
The filter element shall be replaced as follows:

- loosen clamps and remove corrugated hoses from the air filter;
- unscrew clamp nuts, remove the clamp and the air filter;
- unscrew nut 6 (Fig. 9.9) and take cover 1 with filter cartridge 4 out of the filter housing;
- unscrew nut 5 and remove the filter element;
- install a new filter element, assemble the air filter installing the cover in relation to the body as shown in Fig. 9.9;
- install the air filter to its place.

Evaporative Emission Control System

In the course of the motor vehicle operation do pay attention to the following:

- strong smell of gasoline in the cab, under the hood, in locations of fuel passing and steam lines and tubes; in such cases — check tightness



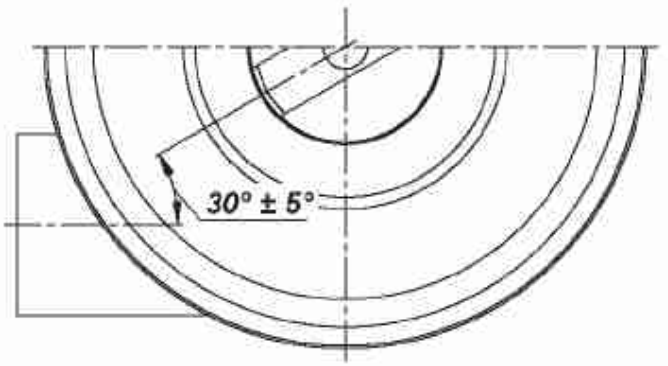


Fig.9.9. Air filter:
1 — air filter cap; 2 — sealer; 3 — filter body; 4 — filter element; 5 — nut; 6 — nut; 7 — bell end

of joints and separator, state of the absorber (absence of cracks and damages, serviceability of the absorber purge valve);

- operability of the evaporative emission control system (including the absorber and the fuel tank valve). Any failure of these elements leads to fuel supply system failures. Damaged components shall be replaced.

Fuel Supply and Ignition Control System

A diagnostic connector (Fig. 9.10) is installed behind the driver's seat at the engine right plate on the cab side for the external diagnostic system.

The control module is installed in the vehicle cab, on the right hand, at the partition behind the driver's seat. On vehicles without partitions, it is installed on the left strut in the cab.

Diagnostics

Functional capabilities of the engine control system and the injection system depend on the mechanical and hydro-mechanical systems proper functioning. Several deviations leading to faults can be mistaken for the control system electronic part malfunctions, these are:

- low compression;
- deviation of gas distribution phases caused by incorrectly assembled engine components;
- air ingress in the inlet pipe line;
- poor fuel quality;
- disregard of servicing periods.

The control unit is capable of diagnosing the engine control unit components to a certain extent.

If a fault is detected, the control unit switches on the fault indication lamp on the instrument panel with the corresponding code recorded in the vehicle's memory.

The engine malfunction lamp switching on does not mean the engine must be stopped immediately, since the control unit has backup modes allowing the engine to work under conditions close to normal.

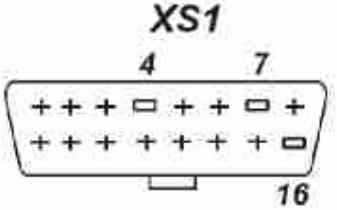


Fig. 9.10. Diagnostic connector (XS1)

In case of faults caused by ignition failures (the engine malfunction lamp starts flashing), to avoid the exhaust converter failure it is necessary to reduce the engine crankshaft rotation speed down to 2,500 rpm (the motor vehicle speed shall not exceed 50 km/h) and to drive to a service station. The alarm flashes are ON every time the converter's allowable temperature is exceeded. Here, one or two engine injectors can be switched off.

The engine operation is only allowed after the fault is eliminated.

Diagnostic Lamp Operation

In the operating mode, when the ignition is turned on and the engine is off, the lamp is on continuously until the engine is on. If the lamp does not go off after the engine start, that means that the diagnosis subsystem has determined faults in electric circuits of the control system.

If the diagnostic lamp does not go off after the ignition is on or lit when the engine is running, that means that the engine or the system needs servicing as soon as possible.

Clearing Fault Codes

The Fault Code Memory can be cleared only by a scan-tester.

If the rechargeable battery switches off, the control unit self-learning parameters are not lost and can be cleared using a scan-tester.

When the fault codes are cleared, the controller accumulated adaptive data (the controller self-learning parameters) are cleared automatically.

Clutch

The fluid level shall be 15-20 mm lower than the upper edge of the tank.

Pedal softness and incomplete clutch release indicate air presence in the hydraulic drive. Bleed the system via bleed fitting 9 (Fig. 9.11) of the working cylinder similarly to the bleeding of the brake hydraulic drive.

The clutch pedal position is adjusted with tappet 6 (Fig. 9.12) of clutch master cylinder by changing its length. Clutch pedal full travel shall be 200±20 mm. Free travel (5-30 mm) is a non-adjustable clutch design feature.

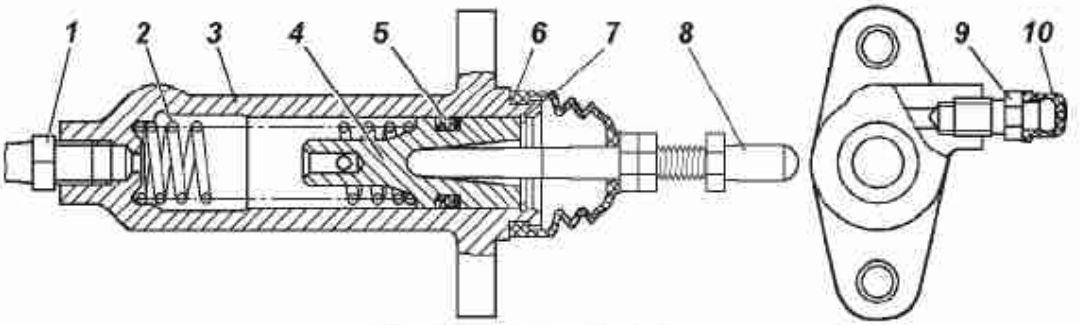


Fig. 9.11. Clutch Cylinder:
1 — fitting; 2 — piston spring; 3 — cylinder housing; 4 — piston; 5 — sealing cuff; 6 — safety cap; 7 — snap ring; 8 — piston tappet; 9 — bypass valve; 10 — cap

Attention! The length of tappet 8 is 112 mm. Do not adjust its length during the vehicle operation.

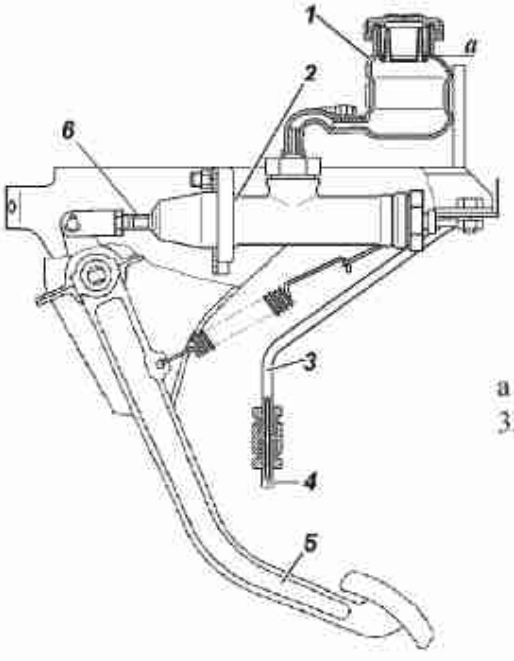


Fig. 9.12. Drive Of Clutch Master Cylinder:
a — fluid level; 1 — tank; 2 — master cylinder; 3, 4 — pipes; 5 — pedal; 6 — tappet

Gearbox and Transfer Case

When a leak is detected, find out the reason and defected parts (gaskets, cuffs), replace them, cover the thread of the hollow bolts and socket surfaces with a sealant gasket. Check the grease level and change it in the gearbox and in the transfer case simultaneously. Its level shall be on the lower edge of filler orifices (Fig. 9.13, 9.14).

When operating the vehicle the grease level in the gearbox can decrease (up to 8 mm relative to the lower edge of the inspection hole), and the grease level in the transfer case can increase. You do not have to even the grease levels.

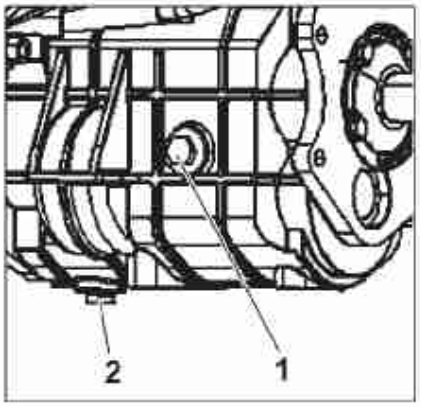


Fig. 9.13. Gearbox Plugs:
1 — filler orifice plug; 2 — drain orifice plug

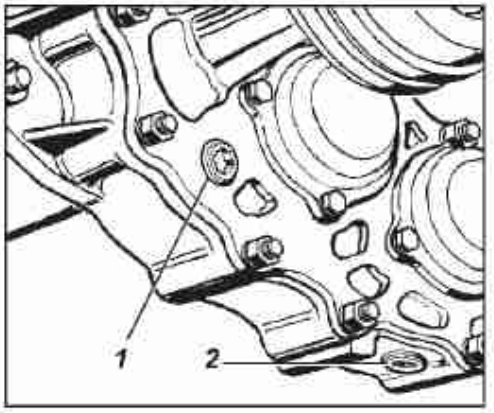


Fig. 9.14. Transfer Case Plugs:
1 — filler orifice plug; 2 — drain orifice plug

Drive-line

The spline coupling is greased through lubrication nipple 1 (Fig. 9.15), which is screwed into the slip yoke, and the needle bearings are greased through lubrication nipples 2 on the crosses.

Lubricate the needle bearings until the grease shows up from under the working edges of the cross oil seals.

Applying solid oil or its mixtures for lubrication of the needle bearings can lead to their premature failure.

Do not apply too much grease to the splines as it will bleed through the spline coupling, resulting in premature failure of the oil seals and possible plug knocking out of the slip yoke.

Fit a special tip on the grease gun to lubricate the knuckles.

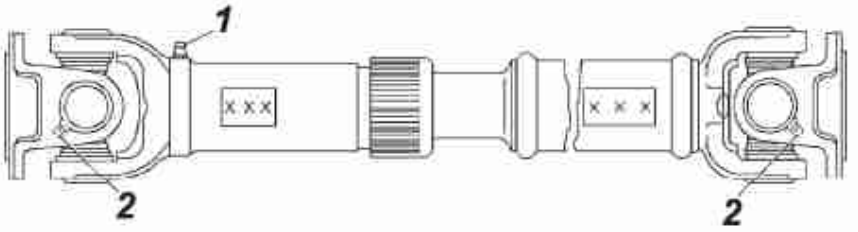


Fig. 9.15. Rear Propeller Shaft:
1 — lubrication nipple for spline coupling; 2 — lubrication nipple for joint needle bearings

Driving Axles

Drain oil through orifice 2 (Fig. 9.16, 9.17) at the bottom of the housing by unscrewing inspection hole plug 1.

Axial clearance of more than 0.05 mm in the bearings of the axle drive pinion is not allowed, as greater clearance will lead to premature pinions teeth wear and the axle jam. Check the axial clearance in the bearings by swinging the drive pinion by the universal-joint flange.

The axial clearance in the differential bearings is also not allowed. Check it via oil-filling holes (axles in Fig. 9.16) or by swinging the driven wheel with the housing cap opened (axles in Fig. 9.17).

If clearances are detected, the axle shall be adjusted. The axle adjustment is a labour-intensive operation requiring specific skills and instruments, that is why it is recommended to adjust it only at a service station.

Front axles and reduction gear are switched using the transfer case lever.

While inspecting the steering knuckles, check adjusting bolts 1 (Fig. 9.18) and steering stop bolts 3. The value of steering angle B of the right wheel to the right and of the left wheel to the left shall be within the limits of 26-27°. The excessive steering angle results in contacts between the wheel and the suspension parts.

It is not required to add the grease into the spherical pins and into the axle ball struts. The grease in the units is changed during maintenance.

Steering knuckle pins tightening is adjusted at the factory under pre-load along the common axle shaft of the pins.

During vehicle operation pay special attention to the tightening of the steering knuckle pins. When the interacting spherical surfaces of liners 3 (Fig. 9.19) or pins 2 wear out, the pre-load disappears, and the air gap appears along the common axle shaft of the pins. Tighten clamping bush 10 to eliminate the air gap.

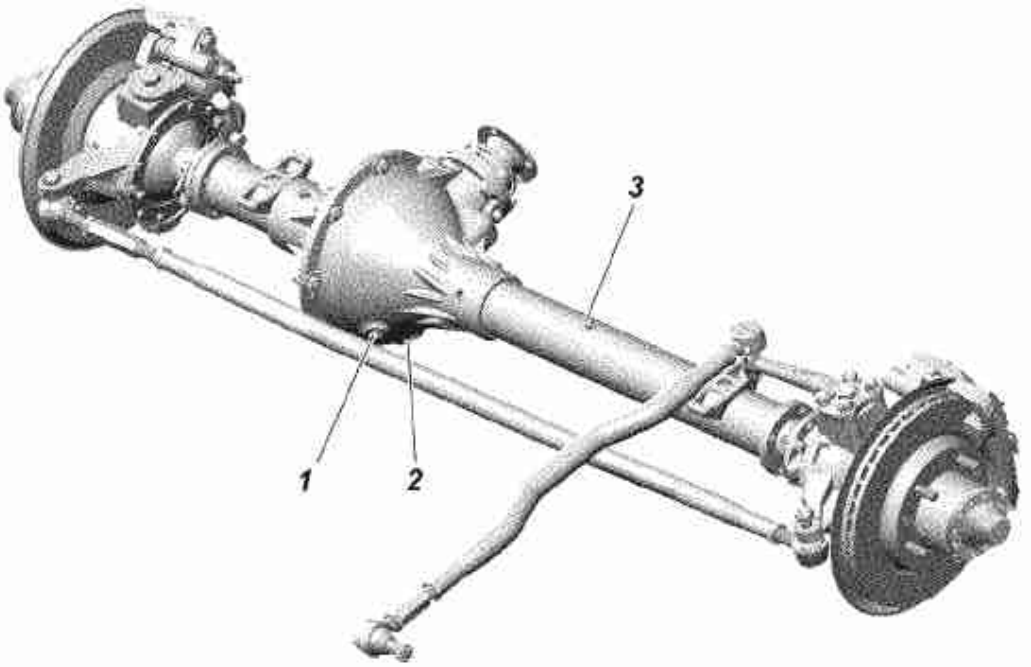


Fig. 9.16. Front Axle with Vertically Split Housing:
1 — gauge plug; 2 — drain plug; 3 — safety valve

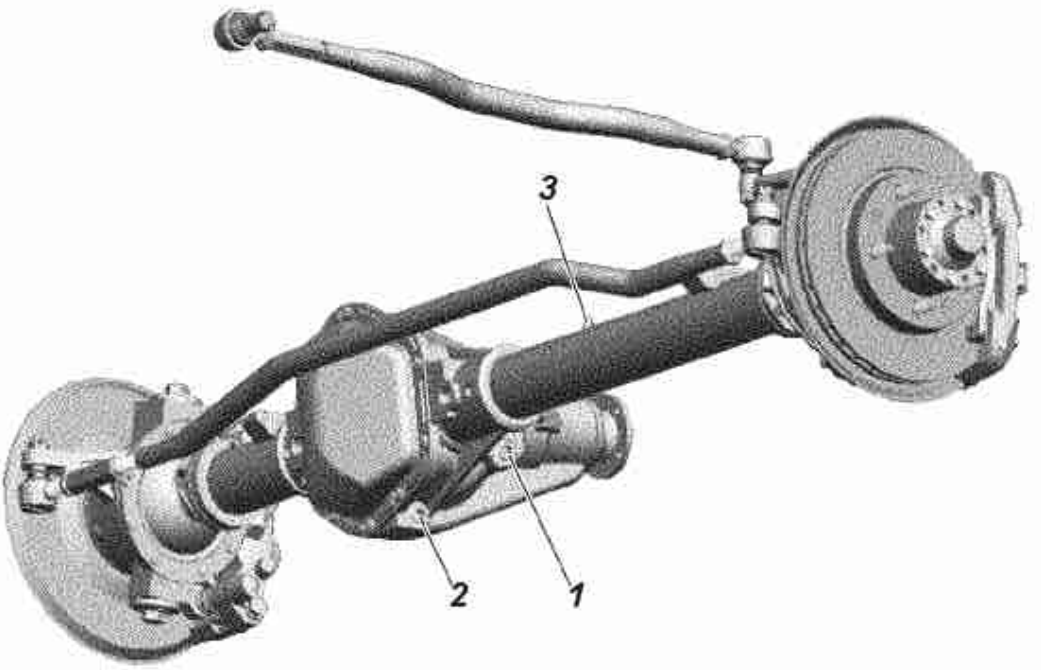


Fig. 9.17. Front Axle With Banjo Housing:
1 — filler orifice plug; 2 — drain orifice plug; 3 — safety valve

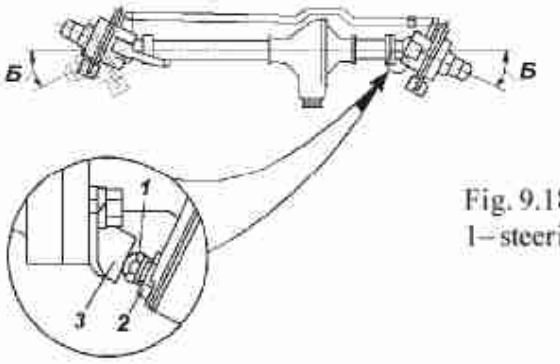


Fig. 9.18. Adjustment of Wheels Steering Angle:
1 – steering stop bolt; 2 — locknut; 3 — steering stop

The front driving axle, operated with air gaps in the pins assemblies, can lead to the premature failure of the upper pin liner.

When operating tighten the clamping bush of the lower pin as follows:

- unscrew nut 13;
- remove lining 12 and gasket 11;
- tighten bush 10 with a special wrench until the air gap disappears (hit the threaded end of the pin with a copper hammer beforehand);
- tighten this bush by turning the wrench by 10-20° to obtain the pre-load along the common axle shaft of the pins;
- install lining 12 and gasket 11;
- tighten nut 13 with the torque of 80–100 N · m (8–10 kgf · m).

ATTENTION! *Exceeded tightening torque can lead to the decreased pre-load and failure of the pin assembly.*

The torque of ball strut 8 (or housing 1 of the steering knuckle, if the ball struts have not been disconnected from the axle shaft housing) shall be within the limits of 10–25 N•m (1.0–2.5 kgf•m) in any direction relatively to the common axle shaft of the pins, considering removed O-rings 5, 6 and joint 7 of the steering knuckle.

If the critical parameter is not reached, tighten the clamping bush once again by turning the wrench by 10-20° and tighten nut 13 with the specified torque.

If air gaps cannot be removed after the tightening of the threaded bush, pins assemblies liners shall be replaced. Contact UAZ service station.

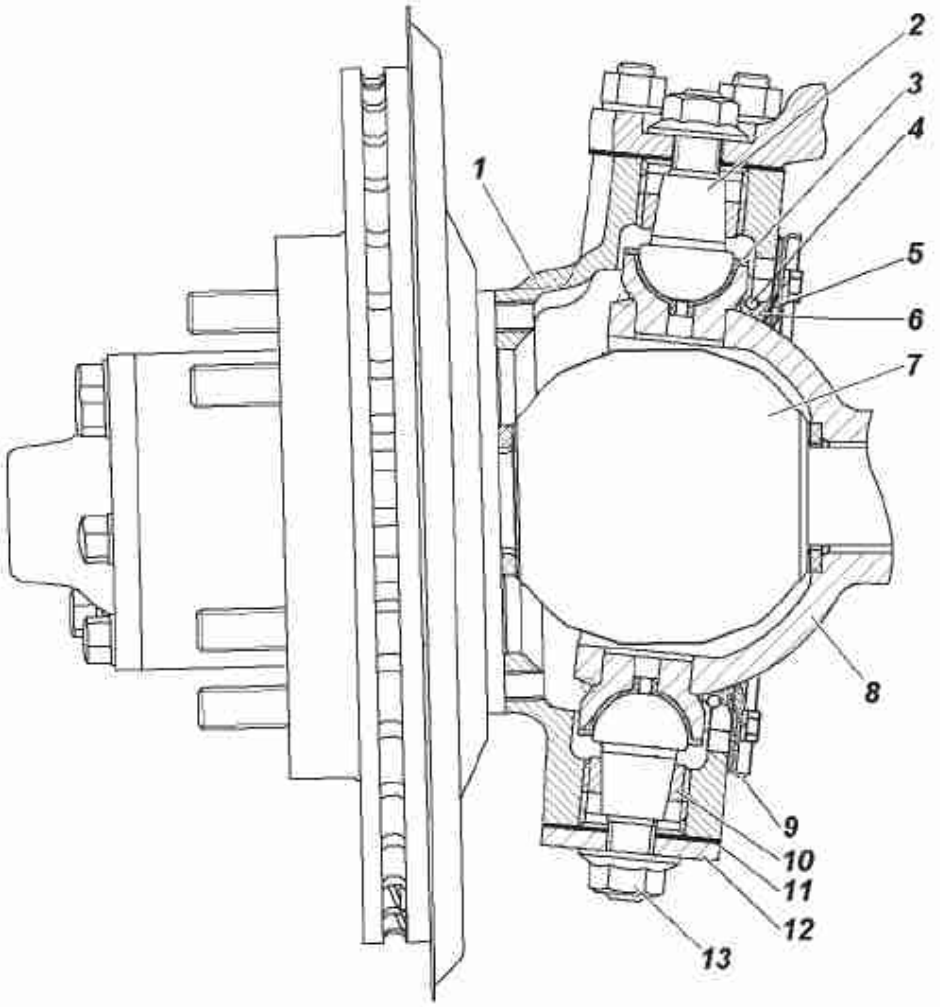


Fig. 9.19. Steering Knuckle and Wheel Hub:
1 — steering knuckle housing; 2 — pin; 3 — pin liner; 4 — spring; 5 — outer O-ring; 6 — inner O-ring; 7 — joint; 8 — ball strut; 9 — outer oil seal housing; 10 — clamping bush; 11 — gasket; 12 — lining; 13 — nut

CHASSIS

Suspension

ATTENTION! *Shock absorber disassembly is strictly forbidden to avoid accidents.*

Vehicle operation at malfunctioning and/or missing shock absorbers and worn out suspension joints is strictly not allowed.

When servicing the vehicle check the tightening of the following units: threaded couplings of leaf spring axle nuts 23 (Fig. 9.21), shackle pins nuts 14 (Fig. 9.21) (for ABS-equipped vehicles) and U-bolts nuts 15 (Fig. 9.20), 19 (Fig. 9.21) (for all vehicles) (see Appendix 2). Check rubber-metal joints, stabilizer pads, springs and shock absorbers. Grease the spring leaves at least once a year to prevent corrosion, which is the

main reason of springs malfunction, and to eliminate spring creaks. To lubricate the spring remove it from the vehicle, dismantle, wash in kerosene, dry and lubricate each leaf thoroughly with the grease, specified in the grease table.

Small-leaf springs can be greased only on surfaces of the spring ends, between the clamps and on side surfaces of the leaves.

Knocks and creaks in the leaf spring supports indicate the wear of rubber pads or rubber metal joints in ABS-equipped vehicles.

While installing leaf springs their final tension is carried out under the vehicle weight.

If anti-roll bar 22 (Fig. 9.21) is removed from the ABS-equipped vehicle, control the length of the bar arms (Fig. 9.21) when installing the anti-roll bar. Turn eye 24 (Fig. 9.21) for adjusting the arms. Tighten locknut 4 after the adjustment is over. **Attention!** Incorrect installation of the bar can lead to worse handling, increased noise, shorter life of the front propeller shaft and to breakdowns of the frame parts.

Shock absorber maintenance involves periodical checks of their tightness and fasteners. The shock absorber can not be dismantled, and it does not require specific adjustment during vehicle operation. **Attention!** Hydro-pneumatic shock absorber disassembly is strictly forbidden to avoid accidents.

When driving on an uneven road, the quick stop of bodyshell swings indicates that shock absorbers work properly.

Wheels and Tires

ATTENTION! *Tires of various models (tread patterns) may have different sizes and stiffness performances, use identical tires on all wheels.*

Worn or damaged tires, under or overinflated tires, deformed rims or loose rims attachment can cause a car accident. Regularly check the tires and their pressure, rims and their attachment.

It is recommended to use tires, which correspond to the operation season and your climate zone.

Screw the nuts by the next but one to tighten the nuts evenly. See the wheels torque in Appendix 2.

Check the pressure in cold tires.

If intensive uneven wear of the front tires is detected, check and adjust the toe-in of the front wheels.

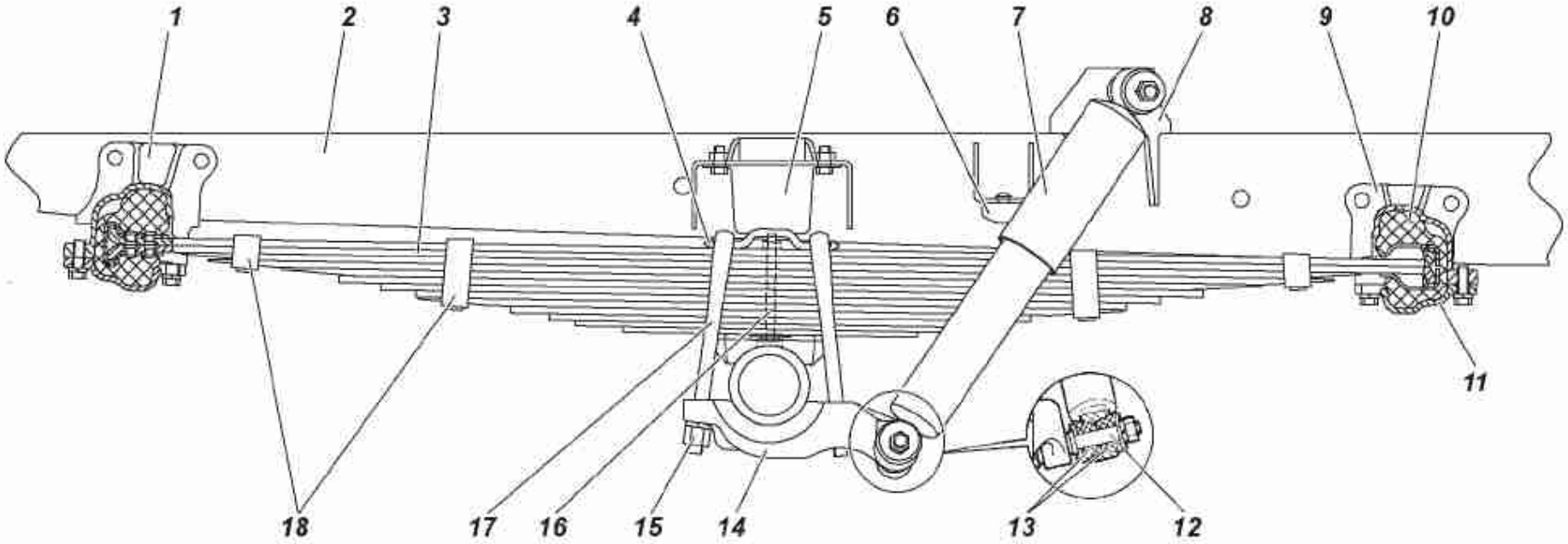


Fig. 9.20. Front Suspension of Non-ABS Vehicles:
1 — front leaf spring bracket; 2 — frame; 3 — leaf spring; 4 — lining; 5 — buffer; 6 — buffer; 7 — shock absorber; 8 — shock absorber bracket; 9 — rear leaf spring bracket; 10 — rubber pad; 11 — bracket cap; 12 — shock absorber stud; 13 — rubber bushes; 14 — U-bolt pad; 15 — U-bolt nut; 16 — tightening bolt; 17 — U-bolt; 18 — clamps

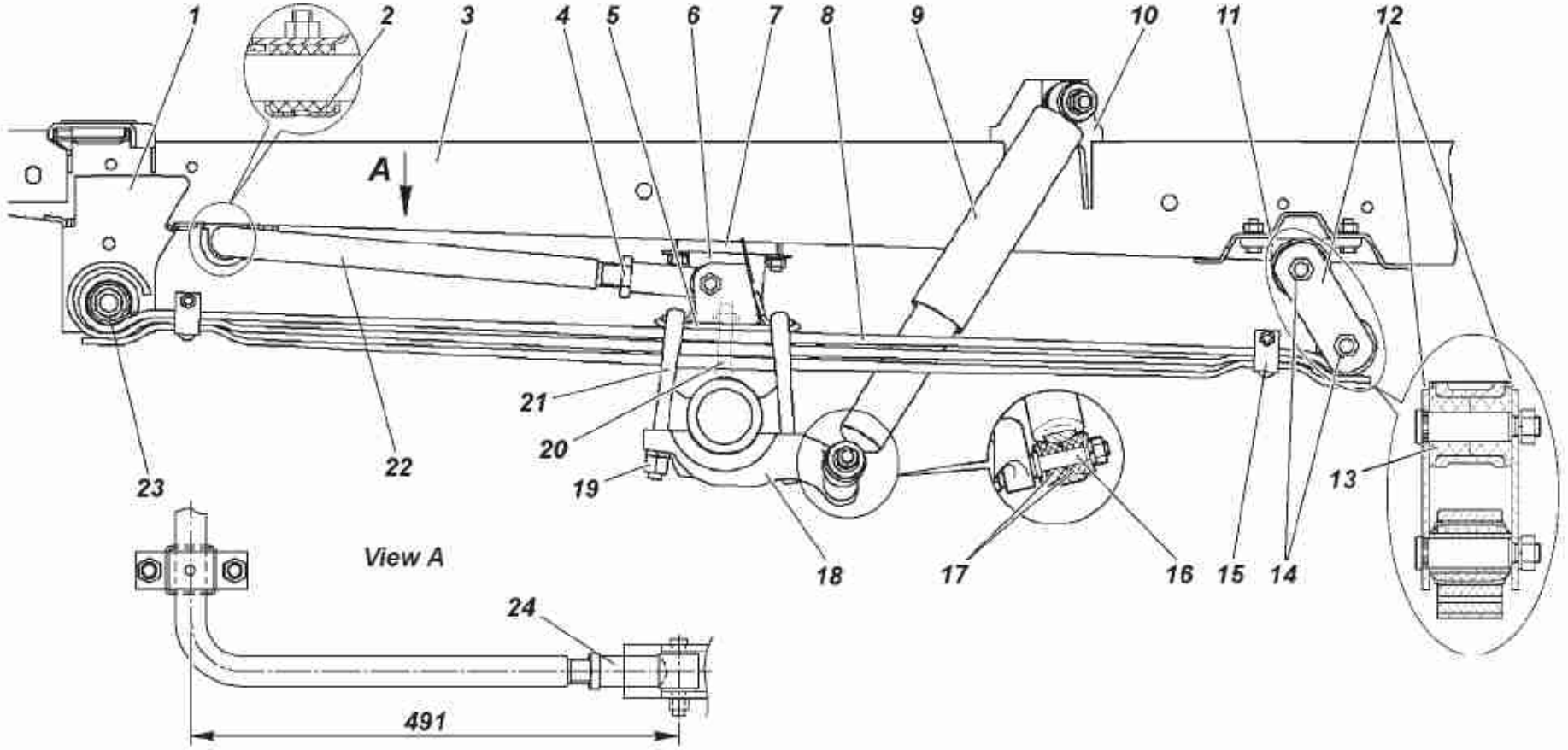


Fig. 9.21. Front Suspension of ABS-equipped Vehicles:

1 — front leaf spring bracket; 2 — stabilizer pad; 3 — frame; 4 — nut; 5 — lining; 6 — buffer; 7 — buffer pad; 8 — leaf spring; 9 — shock absorber; 10 — shock absorber bracket; 11 — bracket of front leaf spring shackle; 12 — shackle web; 13 — bush of leaf spring eye; 14 — shackle pins nuts; 15 — clamp; 16 — shock absorber stud; 17 — rubber bushes; 18 — U-bolt pad; 19 — U-bolt nut; 20 — tightening bolt; 21 — U-bolt; 22 — stabilizer; 23 — nut of leaf spring axle shaft; 24 — stabilizer eye

Check and adjust the toe-in of the wheels on a special stand.

If no stand is available, check and adjust the toe-in of the wheels by the inner surface of tires as follows.

Adjust the toe-in of the wheels with the normal tire pressure, so that dimension A (Fig. 9.22), measured by the center line of the tire side surface in front, is 0.5–1.5 mm less than dimension B behind. Adjust the toe-in of the wheels by changing the length of the steering tie rod: loosen locknuts 1 and 3, having the left- and right-hand thread, and rotate fitting 2 (Fig. 9.23). Tighten the locknuts after adjustment.

Replace the wheels to wear the tires evenly. Replace them only on one side — the front instead of the rear one. Do not use the spare wheel for replacement.

The attachment of the spare wheel is shown in Fig. 9.24. The wheel shall be securely fixed on the holder with sector 2 (Fig. 9.24, A) or with bracket 7 (Fig. 9.24, B).

To avoid tire carbonization from the exhaust pipe the wheel shall be moved from the pipe before fixing it, until the air gap of at least 40 mm appears.

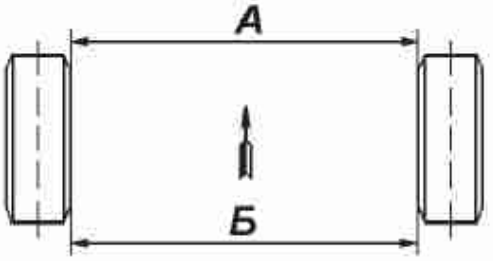


Fig. 9.22. Toe-in

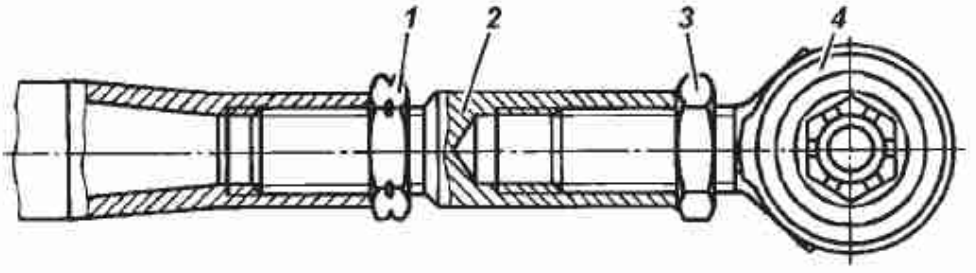


Fig. 9.23. Steering Tie Rod:
1– left-hand thread locknut; 2 — adjusting fitting; 3 — right-hand thread locknut; 4 — joint

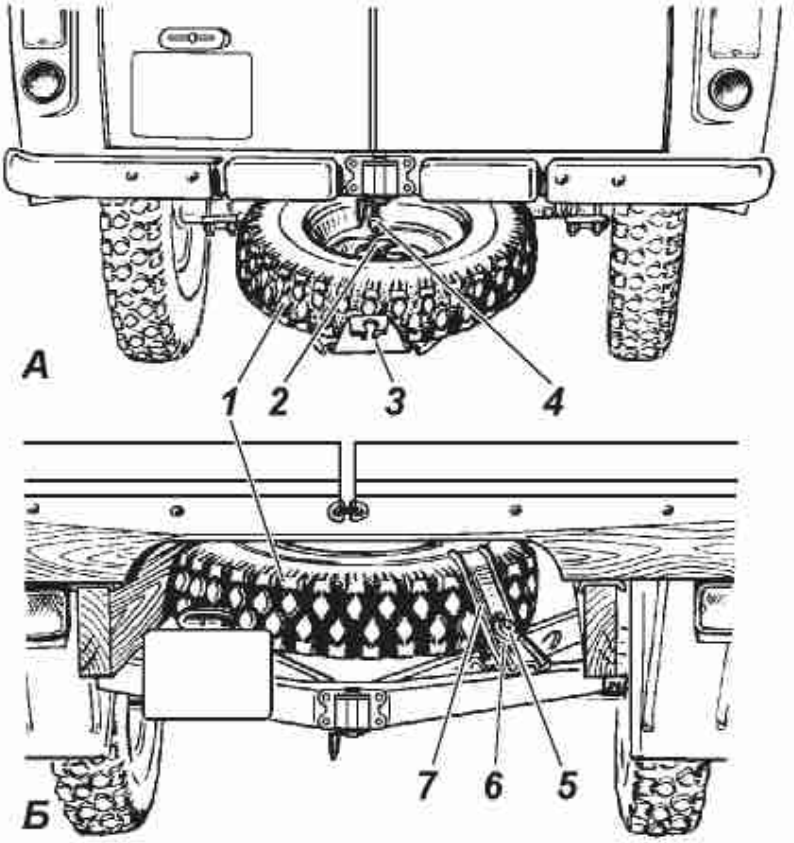


Fig. 9.24. Spare Wheel Attachment:
A — for UAZ-374195, UAZ-396295, UAZ-390995, UAZ-220695, UAZ-330365, UAZ-390945;
B — for UAZ-330395;
1 — spare wheel; 2 — sector; 3 — holder; 4 — nut; 5 — bolt; 6 — washer; 7 — bracket

Wheel Hubs

To change grease remove the hub from the stub axle, remove old grease, thoroughly wash the bearings and the cuff. Grease the bearings and the working edge of the cuff. Fill the space between the bearings rollers with the grease. Apply 10-15 mm of grease between the bearings. Do not apply too much grease into the hub to avoid its contact with break mechanisms.

Swing the wheels to detect the gap in bearings.

Thoroughly adjust the bearings. If their tightening is loose, the vehicle movement provokes shocks in them, and, as a result, damages the bearings. If the tightening is too tough, the bearings overheat, the grease leaks and the bearings break down. Moreover, big air gaps in the front wheel hubs increase brake pedal travel.

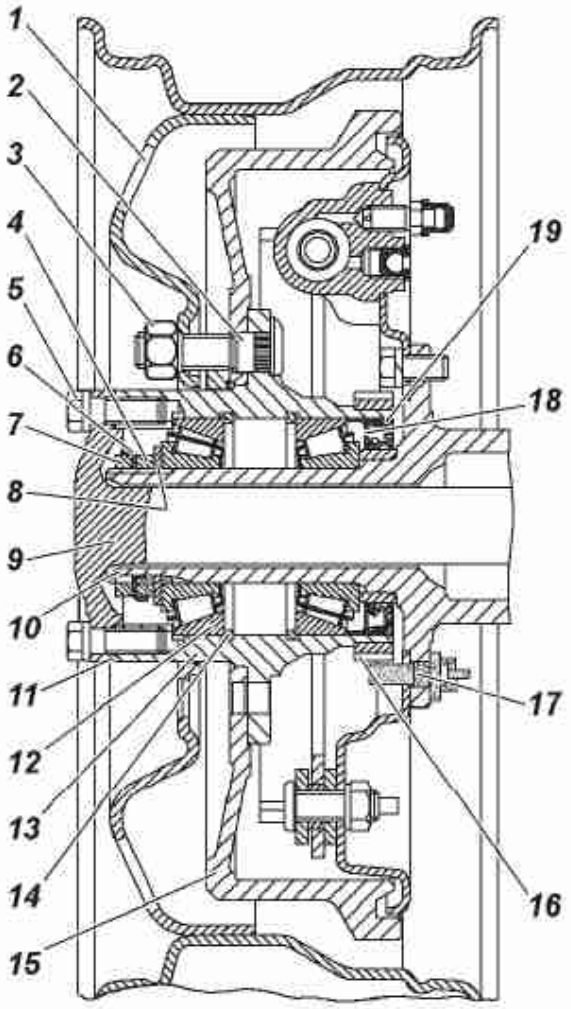


Fig. 9.25. Rear Wheel Hub:
1 — wheel; 2 — hub bolt; 3 — wheel nut; 4 — adjusting nut; 5 — axle shaft bolt; 6 — lock washer; 7 — locknut; 8 — thrust washer; 9 — axle shaft; 10 — stub axle; 11 — gasket; 12 — bearing; 13 — hub; 14 — thrust ring; 15 — brake drum; 16 — impulse disc (for ABS-equipped vehicles); 17 — ABS sensor (for ABS-equipped vehicles); 18 — thrust washer; 19 — cuff

Adjust the wheel hub bearings as follows:

1. Jack up the wheel whose bearings are to be adjusted.

2. Remove axle shaft 9 (see Fig. 9.25) of the rear axle or the hub flange of the front axle.

3. Unbend the tab of lock washer 6, unscrew locknut 7 and remove the lock washer.

4. Loosen bearings adjustment nut 4 by 1/6–1/3 of a turn (1–2 flats).

5. Rotate the wheel with a hand to check it for easy turning (the wheel shall rotate freely without rubbing the brake shoes against the brake disc or the drum).

6. Tighten the hub bearings adjusting nut smoothly with the tightening torque of 25–30 N·m (2.5–3.0 kgf·m).

When tightening the nut, turn the steering wheel to adjust the rollers in the bearing properly.

7. Install the lock washer, screw and tighten the locknut with the torque of 20–25 N·m (2.0–2.5 kgf·m).

When replacing the bearings, tighten the nut with the torque of 35–40 N · m (3.5–4.0 kgf · m) and the locknut with the torque of 25–30 N · m (2.5–3.0 kgf · m).

Install the lock washer with its inner tab into the stub axle slot. If the lock washer tabs have any cracks, replace the washer.

8. Check the bearings adjustment after tightening the locknut. If the adjustment is correct, the wheel shall rotate freely without binding, noticeable axial clearance or wobbling.

9. Bend one tab of the lock washer round the nut flat and the other tab round the locknut flat until its full fitting to the flats. Unbend the tabs, which are the closest to centers of the nut flats.

10. Install the rare axle shaft or the flange of the front axle hub, clean the threaded part of the bolts from old sealant, degrease them and apply fresh UG-6 sealant, tighten the bolts.

When checking the bearings adjustment for heating do not use the pedal brakes, as the hubs can be heated from the brake discs or drums.

Steering System

ATTENTION! *The disabled hydraulic power steering increases the effort, necessary for turning the steering wheel.*

It is not allowed to turn off the IGN and remove the key from the IGN switch while the vehicle is moving. (The steering system shaft is blocked by the anti-theft device when the key is removed, and the vehicle gets uncontrolled).

If the steering system does not work properly, it is not allowed to drive the vehicle or to tow it with a tow-rope. In this case use two wheel towing or tow truck service.

To prevent the power steering pump failure and oil overheating it is not recommended to hold the steering wheel in extreme positions over 20 sec.

The maintenance of the steering system consists in the following: periodically tighten the steering system bolts to the bracket; check the tie rods studs, drop arm attachment, attachment of the steering knuckle lever; check the steering wheel backlash; adjust the steering mechanism; periodically add oil into the tank of the hydraulic power steering system.

Periodically check the tightening of ends nuts and tie rods locknuts and do not let air gaps in the taper joints of levers and studs appear.

The vehicle is equipped with non-repairable ends of tie rods. They do not require adjustment and lubrication during the vehicle operation. If non-repairable ends have an air gap, replace them.

Do the first tightening of the steering mechanism attachment after 500 km run, and then according to the service book.

The total backlash is inspected while the engine is idling. The steering mechanism is normal and does not require adjustment, if the total play of the steering wheel does not exceed 20°, which corresponds to 74 mm on the wheel rim.

If the backlash is higher than the allowable level, detect the unit, which gives the increased play. Thus, the following shall be checked: proper tightening (see Appendix 2) of the steering housing bolts, the tie rod joints, tightening of the propeller shaft nuts, air gaps in the joints and spline couplings of the steering column propeller shaft and air gaps in the steering mechanism.

If a radial air gap in the joint of the steering shaft is detected (axial displacement of the crosspiece in bearings), punch the bearings in yoke eyes, so that the bearing sleeve is not deformed.

Replace the steering column propeller shaft, if air gaps in the spline couplings are detected.

If air gaps in the steering mechanism are detected, adjust the mechanism at UAZ service station.

Hydraulic Power Steering. When turning the steering wheels to the right or to the left up to the stop the noise in the hydraulic power steering may occur as a result of the maximum pressure in the hydraulic pump. This noise is a typical sign of the pump work and it does not influence the efficiency of the steering system.

The steering mechanism can be used only for a short time when the hydraulic power steering is broken as a result of the pump damage, the hose or the pump drive belt malfunction or when the vehicle is towed after the engine stops. If the power steering system lacks oil, the pump drive belt shall be removed, otherwise the pump seizure or the belt rip is possible. Pay special attention to coolant temperature when the pump drive belt is removed to avoid engine overheating.

Long-term vehicle operation with the disabled power steering can lead to the premature wear of the steering system.

Tightening of the power steering pump drive belt (Fig. 9.5) consists in moving the pump along the bracket, mounted to the engine. Loosen the pump bolts mounted to the bracket, move the pump with the tightening screw, until the belt is properly tightened, and screw the pump bolts.

Replace the belt if damages or excessive stretch are detected.

Hydraulic power steering oil: level check and change. To check the oil level in oil tank 3 (Fig. 9.26) place the front wheels straight. Pour the oil into the oil tank up to the level of the filling strainer screen. Beforehand run the oil through the filter with the maximum pour size of 40 μm.

Fill the system as follows:

1. Disconnect the drag link from the drop arm and lift the front wheels with a jack.

2. Uncap the oil tank, pour oil up to the filter screen.

3. Do not start the engine and turn the steering wheel or the input shaft lock-to-lock until air bubbles stop coming out of the oil tank. Add some more oil into the tank.

4. Start the engine and add the oil into the tank simultaneously.

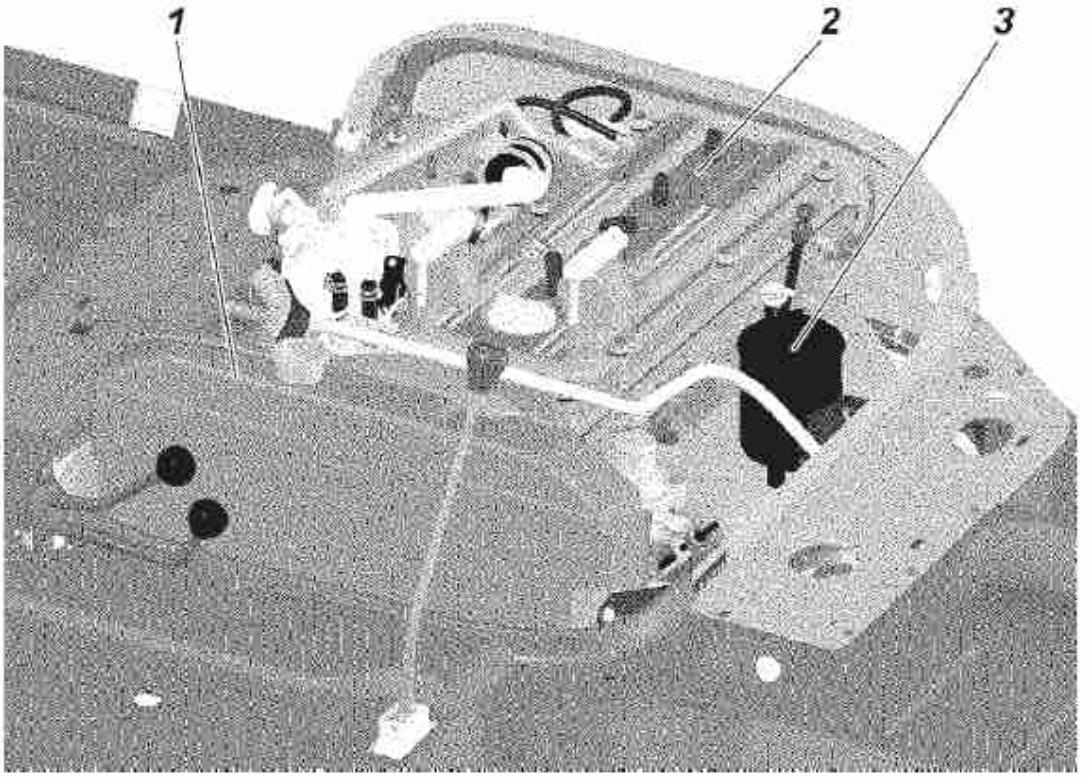


Fig. 9.26. Under Hood Space:
1 — radiator of engine cooling system; 2 — engine; 3 — oil tank of hydraulic power steering system

Note. If the oil foams abundantly in the tank, which means that air has entered into the system, stop the engine and let the oil settle for no less than 20 min (until bubbles come out from the oil). Inspect connections between the hoses and the power steering units and eliminate the leakage, as required.

5. Let the engine run for 15–20 sec and bleed the power steering system to remove residual air from the steering mechanism by turning the steering wheel lock-to-lock 3 times with no stops in the end positions.

6. Check oil level in the tank. Heighten its level up to the filter screen. When the engine is heated up (or the power steering oil is heated up), oil level can be up to 7 mm higher than the screen.

7. Cover the tank and tighten the cap with a hand.

8. Connect the drag link, tighten (see Appendix 2) and secure the ball stud nut with a cotter.

Maintenance of the control and safety valves of the pump. If they get dirty, wash them as follows:

1. Unscrew dummy plug 9 (Fig. 9.27), placed over the outlet orifice of the pump.

2. Remove spring 5 and control valve spool 1, put the dummy plug into its place, which will prevent oil outflow.

3. Unscrew safety valve seat 6, remove ball 4, guide 3 and spring 2. Remove ring 8 and filter 7 from the safety valve seat.

4. Wash the parts and blow them with pressed air.

5. Reassemble the valves in the reverse sequence. Keep clean while reassembling. In order to keep the adjustment of the safety valve while disassembling and reassembling do not change the number of adjusting shims 11.

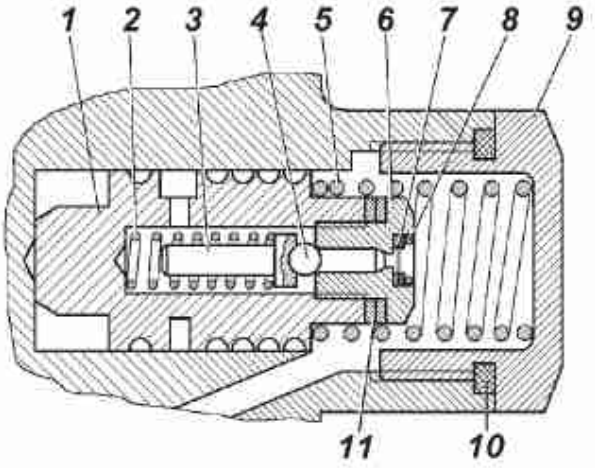


Fig. 9.27. Pump Control and Safety Valves:
1 — control valve spool; 2 — safety valve spring; 3 — safety valve spring guide; 4 — safety valve ball; 5 — spool spring; 6 — safety valve seat; 7 — filter; 8 — ring; 9 — dummy plug; 10 — sealing gasket; 11 — adjusting shims

Brake Systems

ATTENTION! ***Please remember that the stopped engine and the disabled vacuum booster considerably increase the effort necessary for pushing the brake pedal to stop the vehicle.***

ATTENTION! ***If one of the brake circuits is broken, the pedal travel is increased and breaking efficiency is decreased. In this case do not do short-time multiple pedal pushes, instead push the pedal until the maximum breaking.***

If the brake system does not work properly, it is forbidden to drive the vehicle or to tow it with a tow-rope. In this case use two wheel towing or tow truck service.

ATTENTION! ***Brake fluid is poisonous. Keep it in a tightly closed container. While working with it follow these rules:***

- ***avoid any mouth contact with the fluid;***
- ***do not let the fluid dry out on the skin; wash it off with soap and warm water immediately;***
- ***flush the spilled fluid with water, ventilate the room;***

- *take off the clothes covered in the fluid, dry them outside the room and wash.*

Service brake system: disc brakes on front wheels; drum brakes on rear wheels; two separate circuits with the hydraulic drive, coming from the twin-barrel master cylinder: the one barrel to the front wheel brakes, the other barrel to the rear wheel brakes.

Emergency brake system is each circuit of the hydraulic drive.

Parking brake system: drum brake mechanism located behind the transfer case, which affects the rear propeller shaft and has mechanical drive.

The brake fluid level in tank 14 (see Fig. 9.32) can be checked visually using marks on the tank housing made of semitransparent plastic.

When the cap is off and the brake linings are new, the fluid level shall be on the MAX mark. If the brake hydraulic drive works properly, the reduced level of the tank fluid is associated with worn linings of the brakes shoes. The fluid level reduced to the MIN mark indirectly indicates their maximum wear. In this case, control the linings condition, with that there is no need to add fluid into the tank, as installation of new linings heightens the fluid level up to the normal.

The brake fluid warning light comes on when the fluid level falls lower than the MIN mark, which indicates that if the brake shoe linings are new or partially worn, the system is non-hermetic and the fluid leaks. In this case add the fluid only after all leaks are eliminated.

ATTENTION! *If the vehicle is equipped with ABS and the brake fluid level is reduced lower than the MIN mark or air enters the system, do not drive the vehicle and contact a service station, as this failure needs to be inspected with additional diagnostic equipment.*

Bleed the brake system if the vehicle is not equipped with ABS.

Check brake hoses. If cracks appear on the outer side of the hoses, replace them.

ABS-equipped vehicles have steel pipes. If corrosion appears, replace them.

Anti-lock Braking System (ABS) prevents the wheels from locking up while braking, which keeps the initial motion trajectory and minimum braking distance. However the vehicle braking distance can be increased when braking on roads with soft surface (gravel, sand, unrolled snow) compared to lock braking in the same conditions.

ABS braking starts from the speed of approximately 5 km/h and is accompanied by slight pulsation of the brake pedal and typical noise of ABS actuators.

Illumination of the ABS warning light (except for self test mode when cycling the IGN) indicates the system malfunction. Despite the fact that it does not affect the work of the brake hydraulic drive, it is recommended to contact UAZ service station to eliminate the malfunction.

Illumination of the red brake system warning light (except for self test mode when cycling the IGN) indicates critical malfunction (electronic brakeforce distribution (EBD) malfunction, system leakage, etc.). It is not allowed to operate the vehicle with the brake system warning light on.

Front Disc Brakes. To inspect the wear of brake shoes 2 (Fig. 9.28) you can use a mirror or remove the wheel. For the second variant place the vehicle on a level ground and apply the parking brake. Inspect the shoes through the window in caliper 4. If the linings wear to the thickness of 1.5–2.0 mm, replace the shoes on both front wheels.

To replace the brake shoes unscrew bolts 16, remove carrier 18 and spring 1.

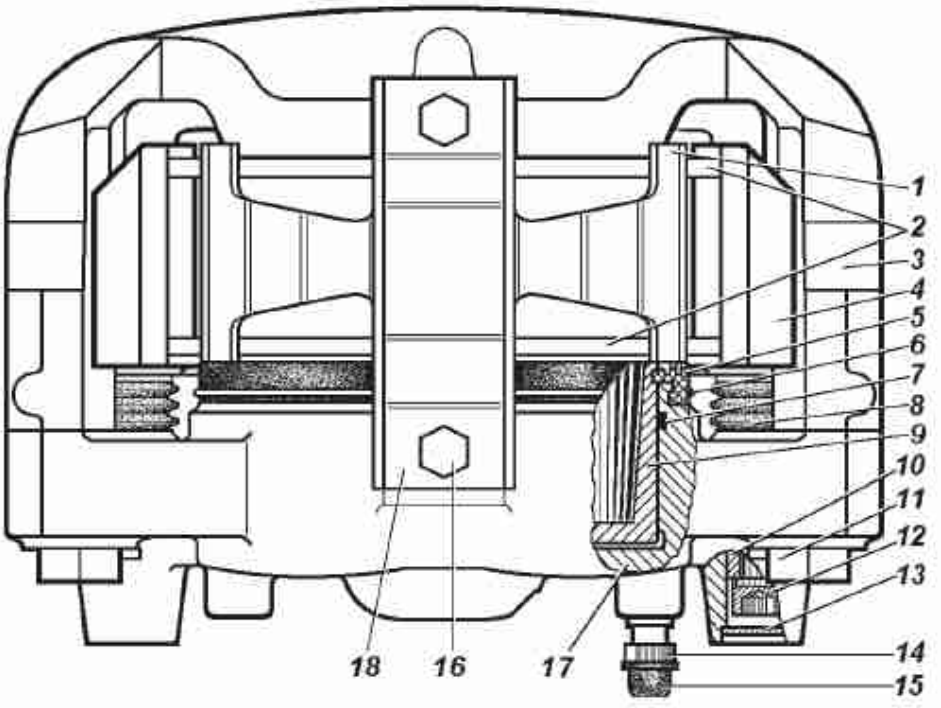


Fig. 9.28. Front Disc Brakes:
1 — spring; 2 — shoes; 3 — clip; 4 — caliper; 5 — safety cap; 6 — snap ring; 7 — O-ring; 8 — protective boot; 9 — piston; 10 — bush; 11 — bolt; 12 — screw; 13 — plug; 14 — bypass valve; 15 — cap; 16 — spring carrier bolts; 17 — crankcase; 18 — spring carrier

Check the brake disc. If its surface has deep notches and burrs, remove it, clean and grind. When the disc wears to the thickness of 20.4 mm, replace it.

Check safety caps 5 and boots 8 for damages and proper installation in seats, replace them, if necessary.

When replacing the shoes add UNIOL 2M/1 TU 38.5901243-92 grease under the boots of the brake guide bushes.

To replace the shoes move clip 3 until pistons 9 are on the inner surface of crankcase 17. Bypass valve 14 can be opened to ease the fluid displacement from crankcase 17. Close valve 14 as soon as pistons 9 are completely sunk into the crankcase. Before moving clip 3 uncap the master cylinder tank and do not let the fluid overflow while moving the clip.

It is forbidden to recess the pistons with a tire iron as it can deform the discs and damage the piston boots.

Replace worn brake shoes from both sides of the front axle shaft. To bring the shoes to the disc press the brake pedal 2–3 times.

Install spring 1, spring carrier 18 and screw bolts 16.

ATTENTION! *Spring carrier 18 is asymmetric. Its long side shall be mounted on crankcase 17 and its short side — on clip 3.*

The necessary air gap between the brake shoes and the brake disc is maintained automatically during the vehicle operation.

In ABS-equipped vehicles the calipers have recesses.

ATTENTION! *The brake disc bolts, the tubing T-connector, the parking brake drive parts, the governor drive and the governor itself are fixed with adhesive sealant (with no spring washers) to prevent unscrewing. Add adhesive sealant if unscrewing these bolts and nuts.*

Rear Drum Brakes (Fig. 9.29). Periodically remove brake drums and clean the brake parts from dust and dirt. The cleaning frequency depends on vehicle operation conditions. Clean the drums more often in summer and when driving dirty roads and rarer in winter.

After the drums are removed make sure that wheel cylinders are securely fixed to the shield. Pay attention to the condition of wheel cylinders, safety caps 7 and to the condition of the brake drum.

Safety caps must be tightly installed in piston and cylinder seats and not be damaged.

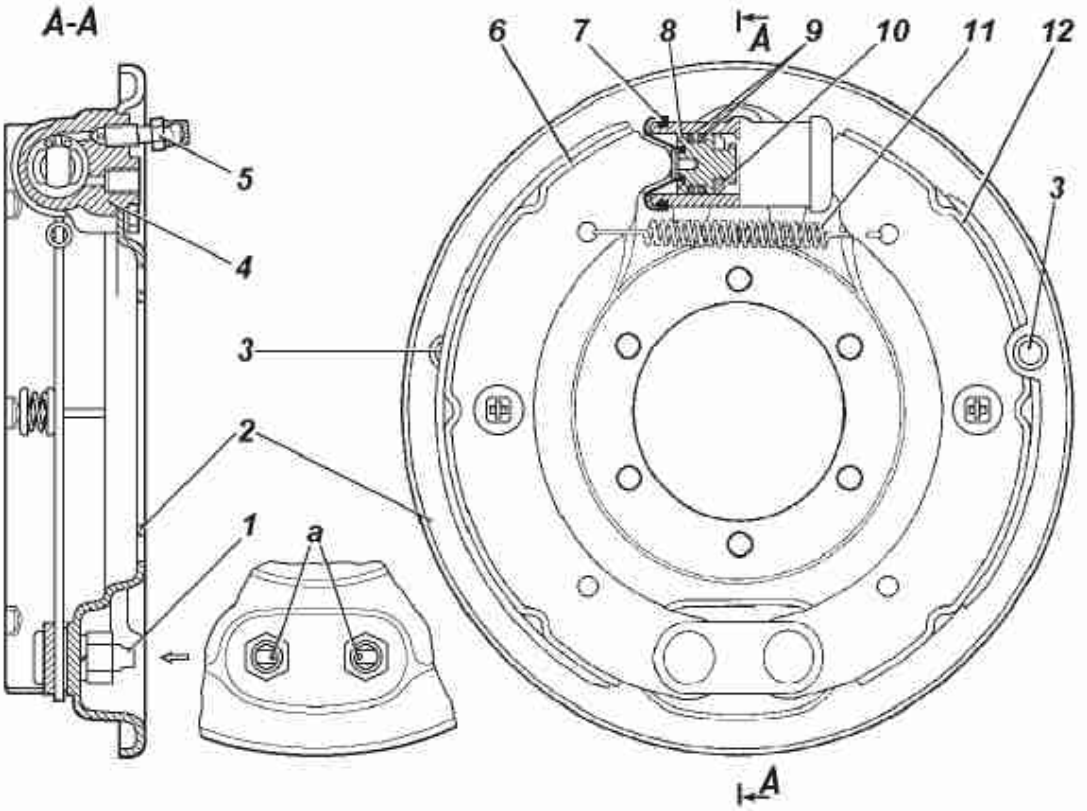


Fig. 9.29. Rear Wheel Brake:

a — anchor stud marks;

1 — anchor studs; 2 — shield; 3 — orifices for visual inspection of brake linings; 4 — wheel brake cylinder; 5 — bypass valve; 6,12 — brake shoes; 7 — safety cap; 8 — piston; 9 — O-rings; 10 — snap ring; 11 — release spring

If the drum working surface has deep notches and burrs or wears unevenly, rebore the drums from its central orifice.

The maximum permissible diameter of the rebored brake drum is 281 mm.

It is not recommended to change the brake drums between the hubs, as working surfaces of the drums will wobble more.

The air gap between the shoes and the drum is restored automatically as the linings wear.

Check the linings wear through the orifices in the shields. Unplug the orifices, inspect the linings (their thickness shall not be less than 2.5 mm), plug the orifices.

Replace the linings in case of their excessive wear (the rivets are sunk less than 0,5 mm).

When replacing the worn shoes or linings move the piston with the thrust ring deep into the cylinder for putting the drum on the shoes freely.

After reassembly push the brake pedal 2-3 times to install the pistons into the working position.

Do not press the brake pedal when the brake drum or the front brake shoes are removed, as the compressed fluid will press the pistons out of the wheel cylinders and the fluid will escape.

During every drum removal grind the lip on the edge of the friction surface, which appears from the drum wear, to ease the next removals of the drum.

Tighten the brake shield bolts when the hubs are removed.

Proportioning Valve. Non-ABS vehicles are equipped with the mechanical proportioning valve, which affects the rear brakes (Fig. 9.30), ensures the optimal distribution of braking forces between the axle shafts and prevents the rear wheels from blocking earlier than the front wheels. When servicing the vehicle check the proportioning valve. Clean it from dirt and check its attachment. Make sure by visual inspection that the valve and its drive parts are not damaged, the brake fluid does not leak, and the coupling of the pillar with the flexible arm or the bracket on the rear axle has no play.

When pressing the brake pedal proportioning valve, piston 17 (Fig. 9.30) shall move out from the housing for 1.7–2.3 mm. If the piston has

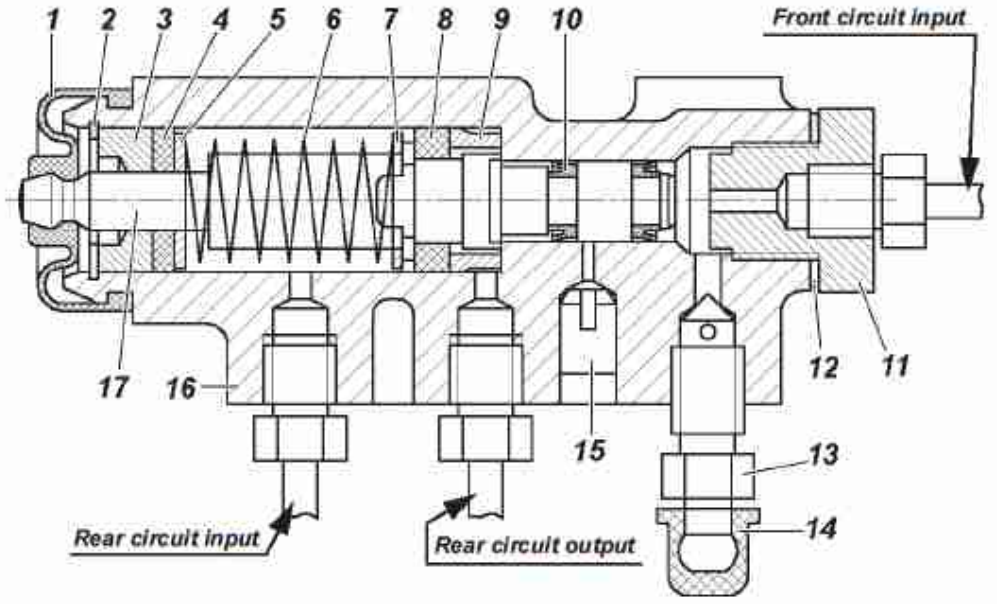


Fig. 9.30. Proportioning Valve:
1 — protective boot; 2 — snap ring; 3 — bush; 4 — piston O-ring; 5, 7 — piston spring supporting washer; 6 — piston spring; 8 — seal; 9 — housing bush; 10 — cuff; 11 — lock; 12 — lock gasket; 13 — bypass valve; 14 — cap; 15 — plug; 16 — housing; 17 — piston

no stroke, as well as poor or excessive stroke, the valve or its drive has malfunctions.

When inspecting the hydraulic drive pay attention to protective boot 1, to the position of gauge plug 15 and to brake fluid leaks from it. The plug shall normally be sunk into the housing orifice of the valve. If the plug comes out or the brake fluid leaks, the valve must be replaced.

The protective boot shall be tightly installed in the seats of the piston and the housing shall have no damages.

During the operation and during rear springs replacement adjust the force of flexible arm 5 (Fig. 9.31) to the valve piston. For adjustment do the following:

1. Install the vehicle on an even level ground.

2. Loosen locknut of adjusting bolt 4 (Fig. 9.31) and unscrew the bolt for 2–3 turns.

3. Screw bolt 4 (Fig. 9.31) until it touches piston tail 17 (see Fig. 9.30) of the valve.

4. Tighten the locknut.

5. Check the stroke of the valve piston (see above).

6. Check the adjustment correctness in motion of the vehicle. While going on a straight level road with a dry surface, brake the vehicle until wheels block. If the valve operates properly and drive adjustment is done correctly, the front wheels shall be blocked slightly earlier than the rear ones. If the rear wheels are blocked earlier, unscrew bolt 3 for 1–2 flats of the bolt head and check the brakes in motion again.

The pedal travel is adjusted by changing the length of vertical drive rod 9 (Fig. 9.32). The pedal full travel is 200 mm. The pedal free travel shall be 5–14 mm.

Check the pedal free travel when the engine is stopped.

Fill the brake system (for example, when replacing a hose or a pipe) as follows:

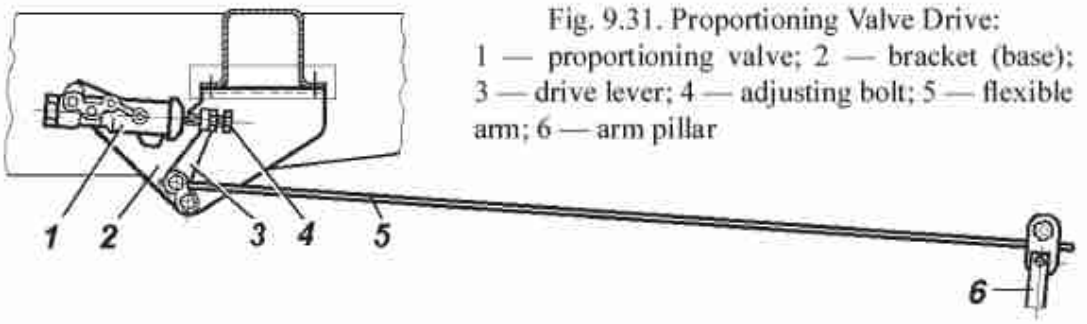


Fig. 9.31. Proportioning Valve Drive:
1 — proportioning valve; 2 — bracket (base); 3 — drive lever; 4 — adjusting bolt; 5 — flexible arm; 6 — arm pillar

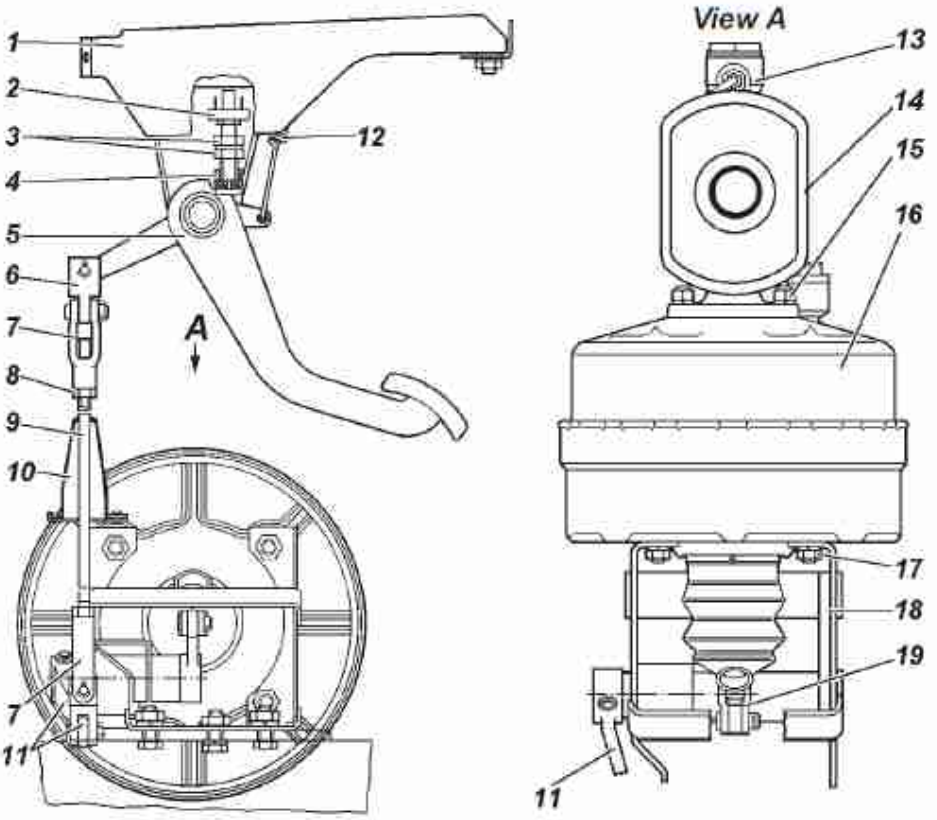


Fig. 9.32. Drive of Master Brake Cylinder:
1 and 18 — brackets; 2 — brake signal switch; 3 — nuts; 4 — buffer-stop; 5 — brake pedal; 6 — intermediate yoke; 7 — yoke; 8 — locknut; 9 — rod; 10 — boot; 11 — intermediate lever; 12 — release spring; 13 — master brake cylinder housing; 14 — tank; 15 and 17 — nuts; 16 — brake vacuum booster; 19 — tappet yoke

ATTENTION! *Fill the brake system of ABS-equipped vehicles at a service station, as it requires additional diagnostic equipment.*

1. Check all couplings of the brakes hydraulic drive for leaks and the condition of the flexible rubber hoses.

2. Clean the bypass valves and the safety caps of the wheel cylinders and the proportioning valve from dust and dirt.

3. Remove the radiator case, clean the master cylinder tank from dust and dirt around the cap and uncover it. Fill the tank with brake fluid up to the MAX mark.

4. Press the brake pedal several times to eliminate the effect of depression in the brake booster.

5. Bleed the brake system.

Bleed the system as follows:

ATTENTION! *While bleeding add the fluid to the master cylinder tank in time and do not let the fluid level decrease lower than the MIN mark. Do not let air come into the system.*

If air comes into the brake system of the ABS-equipped vehicle, contact a service station. It is forbidden to operate the vehicle until the malfunction is eliminated.

1. Bleed successively the chambers of the right and left rear brakes wheel cylinders, the front circuit of the proportioning valve (for non-ABS vehicles), and then the right and the left front brakes wheel cylinders.

2. Uncap the bypass valve of the wheel cylinder and put a special rubber hose (approximately 400 mm long) on the valve.

Drop the other end of the hose into a transparent vessel no less than 0.5 l in capacity, which is half-filled with the brake fluid.

3. Press the brake pedal 3–5 times abruptly, hold it in the extreme position and simultaneously unscrew the bypass valve for 1/2–3/4 of a turn to release a fluid portion from the system into the valve. Screw the bypass valve while pressing the brake pedal.

Repeat this step until bubbles stop coming out from the hose, dropped into the vessel with the brake fluid.

4. As bleeding is over, screw the bypass valve and remove the hose. Dry the valve head and put on the safety cap.

Add the brake fluid up to the MAX mark into the master cylinder tank.

Cover the tank carefully to avoid breaking the cap.

While bleeding hold the hose end dropped into the fluid.

Check the brake system when driving the vehicle. If the working brakes and their drives are adjusted correctly and the brake system is properly bled, full braking occurs within 1/2–2/3 of the pedal travel.

It is forbidden to add the brake fluid, collected in the vessel after bleeding, to the master cylinder tank.

Do not press the brake pedal when at least one drum is removed, as the compressed fluid will press the pistons out of the wheel cylinders and the fluid will escape.

For the brakes to work properly (especially those with ABS), change the brake fluid once every two years. Follow the rules of filling the brake system with the fluid, until the fresh fluid will come out from the hose.

The parking brake is maintained as follows: periodically check the brake (Fig. 9.33) and its drive, adjust the lever travel, check the attachments, clean and grease the parts of release and adjusting mechanisms and eliminate any detected malfunctions.

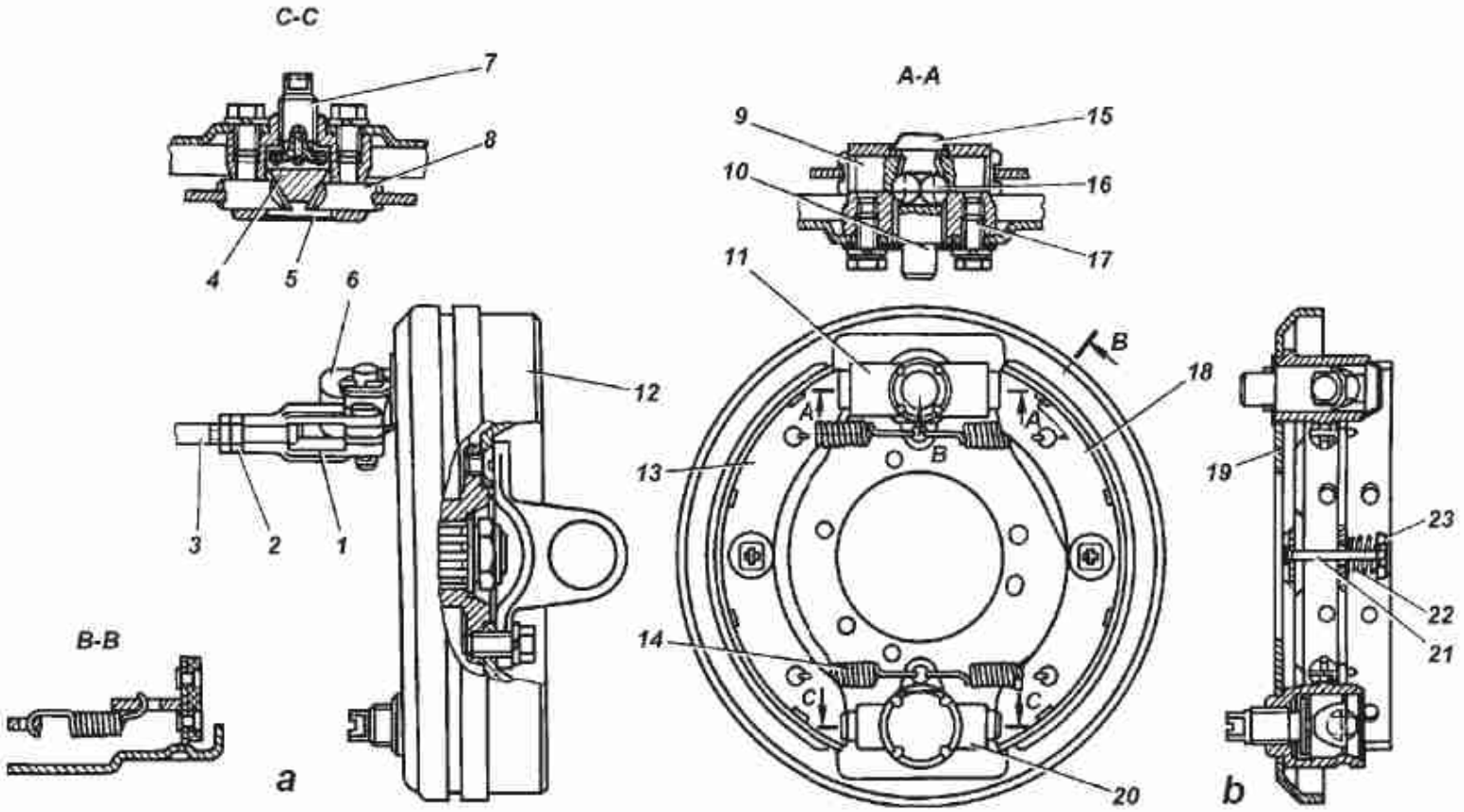


Fig. 9.33. Parking brake:

1 — adjusting yoke; 2 — locknut; 3 — cable; 4 — release mechanism; 5 — plug; 6 — drive lever; 7 — adjusting screw; 8 — shoe lining; 9 — release mechanism tappet; 10 — balls housing; 11 — release mechanism housing; 12 — brake drum; 13, 18 — shoes; 14 — brake release spring; 15 — cap; 16 — release mechanism ball; 17 — bolt; 19 — brake shield; 20 — adjusting mechanism housing; 21 — bar; 22 — spring; 23 — spring cap

a — view with brake drum; b — view without brake drum

Clean the brake shoes of dust and dirt and sand them if they get greasy. Replace greasy linings or keep them in gasoline for 20-30 minutes and grind them with sand paper or wire brush.

Replace the linings and the shoes in case of the linings excessive wear (the rivets are sunk less than 0.5 mm). Grind the installed linings, so that their diameter is 0.2–0.4 mm less than the brake drum diameter.

Despite the labyrinth seal of release and adjusting mechanisms they gradually collect dirt, therefore dismantle and clean the mechanisms (especially the release mechanism), adding fresh grease. Do not let the grease contact the drum and the linings.

The brake shall be adjusted when the brake lever travel gets more than the half of its maximum travel and when the braking effect becomes insufficient.

Adjust air gaps between the shoes and the drums (for worn linings) as follows:

1. Shift the transfer case lever into the neutral position and switch off the front axle.

2. Move parking brake lever 1 (Fig. 9.34) into its extreme front position.

3. Jack up the vehicle from the rear wheel side.

4. Tighten adjusting screw 10, so that the brake drum cannot be turned by hand.

5. Loosen adjusting screw 10 by 4–6 clicks (1/3–1/2 of a turn), so that the drum revolves freely.

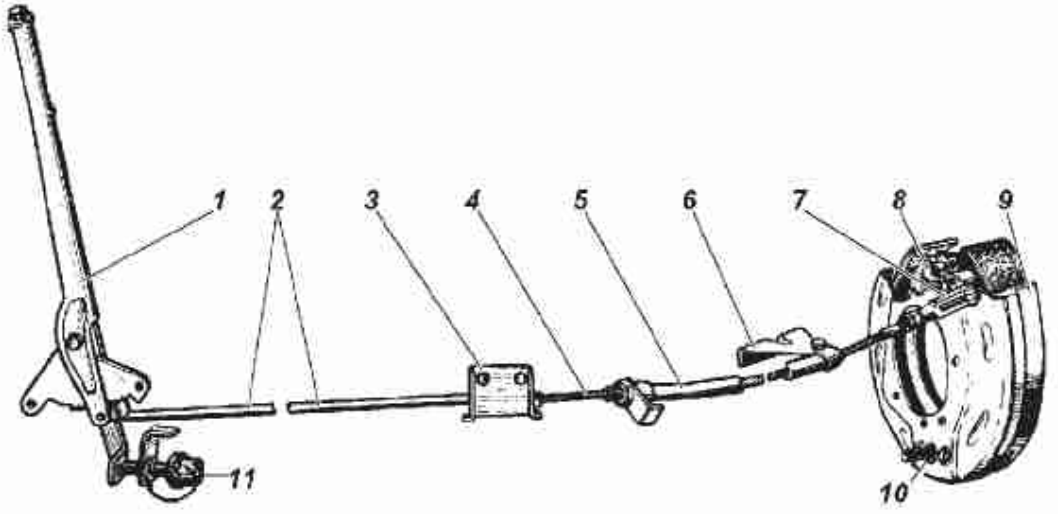


Fig. 9.34. Parking Brake Drive:
1 — drive lever; 2 — rod; 3 — bracket; 4 — cable; 5 — protective tube; 6 — protective tube bracket; 7 — cable yoke; 8 — lever; 9 — parking brake drum; 10 — adjusting screw; 11 — signal lamp switch

Adjust the cable length (when replacing the cable) as follows:

1. Move brake lever 1 into its extreme front position.

2. Unscrew the locknuts of adjusting yoke 7, remove the snap pin and take out the stud, which connects the yoke with brake drive lever.

3. Adjust the cable length by turning the adjusting yoke, until the orifices in the yoke and the lever coincide, and choose the cable slack. The lever must contact the housing of the release mechanism balls.

4. Unscrew the adjusting yoke for 1.5–2 torques, combine the orifices in the yoke and the lever, install the stud, secure with a cotter and tighten the locknuts.

If adjusted correctly, the vehicle shall brake when the lever pawl is installed into the 2nd or 3rd sector slot from the rear part (2–3 clicks).

It is forbidden to check the parking brake system while moving. It shall be done only on a slope.

Relay and Fuse Box

The relay / fuse box is located on the right from the passenger under the instrument panel, next to the bodyshell front rack (Fig. 9.35). The scheme of relays and fuses is shown on the inner side of the box cap (Fig. 9.36).

To access the relay / fuse box remove its cap.

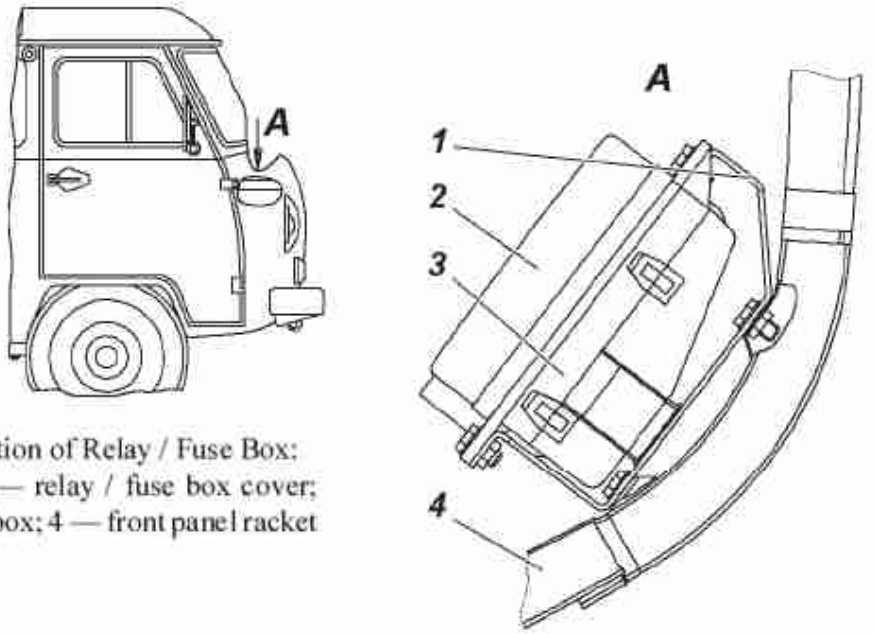


Fig. 9.35. Location of Relay / Fuse Box:
1 — bracket; 2 — relay / fuse box cover;
3 — relay / fuse box; 4 — front panel racket

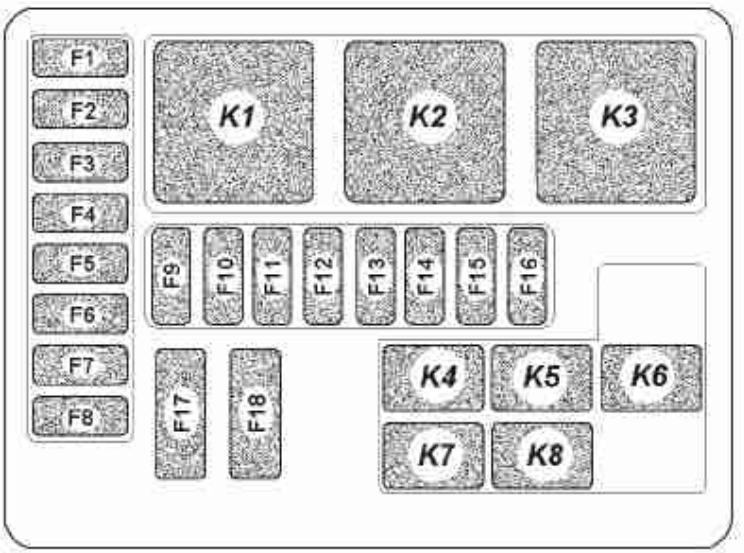


Fig. 9.36. Relay / Fuse Box:
K1–K8 — relays; F1–F18 — fuses (see Table 9.1)

Before replacing a bad fuse find out why it blew and correct the issue.

Do not use metallic objects while removing a relay or a fuse.

While operating the vehicle and checking the electric equipment scheme do not use non-UAZ certified fuses (see Table 9.1) and do not loosen the wires on the ground wire (to check the work of the chain).

Table 9.1. Fuse Protected Chains

Designation	Current, A	Protected Chains
		Relay / Fuse Box
F1	15	Spare
F2	25	Horn, heating system
F3	20	Fuel pump, engine control system
F4*	25	ABS
F5	15	Lighter socket, cab lighting
F6	15	Alarm signal
F7	15	Stop signal, rear fog lights
F8	20	Starter motor
F9	10	Integrated microprocessor controlled engine system, 15 A
F10	15	Gages, alarm signal
F11	20	Windshield wiper, reverse
F12*	10	ABS
F13	15	Seats heating
F14	10	Low beam
F15	10	High beam
F16	10	Parking lamps, gages illumination
F17	80/90	Punch-down block
F18*	40	ABS

* If available

Alternator

WARNING! Even short-time engine operation with the battery off can lead to alternator diode damage.

When removing the alternator for maintenance, switch off the battery by disconnecting the cable from the minus terminal.

Keep the alternator clean. Blow the alternator with pressed air to remove dust and check the brush assembly. Replace the brushes as required.

Battery

The battery is installed in the cab on the left, behind the wheel arch. UAZ-220695 and UAZ-396295 vehicles have a ventilation tube on the battery. Tube 2 (Fig. 9.37) goes outside the cab under the hood. Check the alternator if the battery is discharged, overcharged by the alternator or electrolyte starts boiling.

Keep the battery clean and charged and protect the battery clips and the cable terminals from oxidation.

Periodically clean vent orifices in the plugs, check electrolyte level and add distilled water as required.

Before operation adjust the electrolyte density, corresponding to the climate area of the vehicle operation (see the Battery Operating Manual).

At the factory the vehicle is installed with the battery, the density of which is 1.28 g/cm^3.

Do not let continuous battery discharge by large current (when starting a cold engine in winter time).

Thoroughly prepare the engine for starting and turn on the starter motor only for a short period of time — no more than 10 sec.

Operate the battery in correspondence with the Battery Operating Manual. When parking the vehicle for a long time switch the battery off by disconnecting the cable from the minus terminal.

Replace the battery on UAZ-220695 and UAZ-396295 vehicles as follows:

1. Disconnect tube 2 (Fig. 9.38) from battery 5;
2. Install a new battery;
3. Insert tube adapter 4 into the ventilation orifice on the battery.

Starter motor

Turn off the battery by disconnecting the wire from the minus terminal while removing the starter motor for maintenance.

Periodically do the following:

- check the bolts, which mount the starter motor to the engine, for tightening and clean them from dirt;
- check starter motor terminal ends for cleanliness and mounting security.

Turn off the battery while removing the starter motor for maintenance.

As the starter motor has been removed:

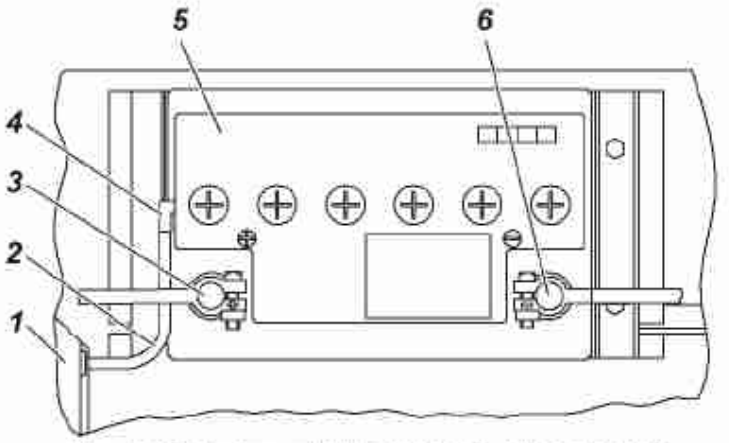


Fig. 9.37. Battery of UAZ-220695, UAZ-396295:
1 — hood; 2 — ventilation tube; 3 — plus terminal; 4 — adapter; 5 — battery; 6 — minus terminal

- check the relay switch outputs and the working surface of electric terminals;
- check the starter motor drive — a gear, a lever and a spring;
- clean rubbing parts from dirt and lubricate them with Litol-24 grease as required.

The starter motor drive shall move freely with no jamming at the shaft splines, and it shall be brought back to the initial position by the return spring. The anchor shall not revolve when the drive gear goes to the working rotation direction. In case of reverse rotation the gear shall revolve with the shaft. Turn the shaft by hands to check the ease of rotor rotation in bearings with the brushes lifted.

Warnings:

1. The sleeve of the starter motor travel can be broken if the starter motor is on after the engine begins working.

2. Do not wash the starter motor caps and the drive with gasoline or kerosene to avoid grease removal from bronze graphite cellular plain bearings.

ATTENTION! *It is forbidden to move the vehicle with the starter motor. The starter motor shall work not more than 10 seconds uninterruptedly. Turn on the starter motor again after at least 1 minute, but for no more than 3 times totally. If the engine cannot be started, detect and eliminate the malfunction.*

Despite the good sealing, dust may penetrate into the beam unit. Without dismantling the beam unit wash it with clean water through the unit orifice, and then dry the unit.

To replace a bulb in the lamp, untwist screw 1

(Fig. 9.38) and remove decorative ring 2. Loosen three screws 5 and remove inner ring 4 with beam element 3.

Adjust lamps as follows:

1. Park the vehicle, which shall have its curb weight and 75 kg loaded driver's seat, on an even level ground, so that the vehicle longitudinal axis is perpendicular to the screen, which is 10 meters far from the headlamps center, and remove rings from the headlamps.

2. Turn on the lamps and make sure that the low beam is switched to the high beam (and vice versa) simultaneously on both headlamps, using the turn indicators and beam switch lever.

3. Turn on the low beam and, closing one headlamp, adjust the other one with screws 6 (see Fig. 9.38), so that the light spot on the wall or on the screen is located as shown in Fig. 9.39. Adjusting screws of the headlamps are located symmetrically to the headlamps center in a horizontal plane.

4. Adjust the second headlamp as the previous one, making sure that the upper borders of light spots are on the same height.

5. Install the headlamps rings.

+**Front fog lights** shall be adjusted so that the light spots on the wall or on the screen are located as shown in Fig. 9.40. For replacing the fog light bulb remove the cover of the bulb holder by turning it counterclockwise and take it out.

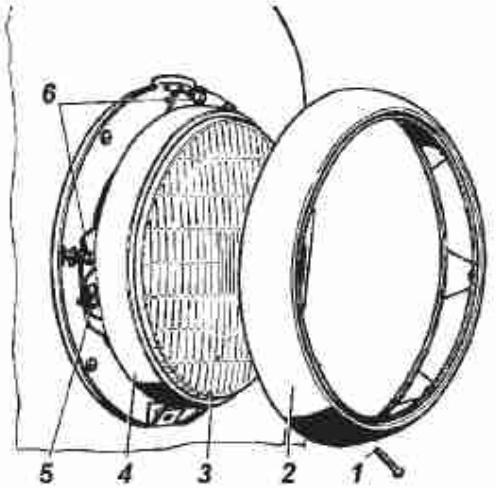


Fig. 9.38. Headlamp:
1, 5 — screws; 2 — decorative ring;
3 — beam unit; 4 — inner ring;
6 — adjusting screws

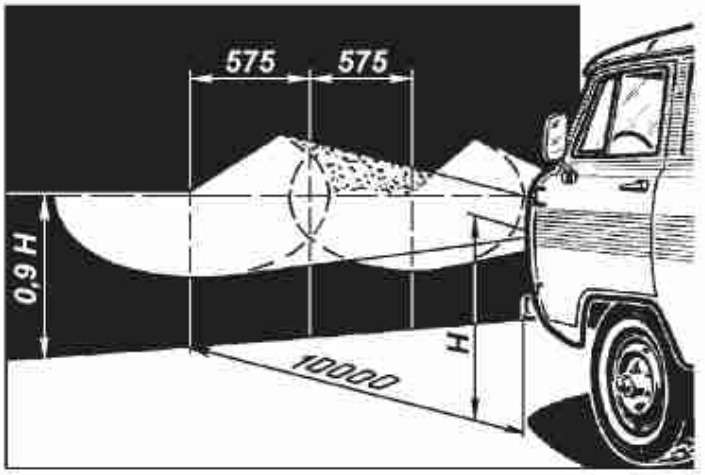


Fig. 9.39. Screen marking for headlamps adjustment:
H — distance between headlamps center and ground level

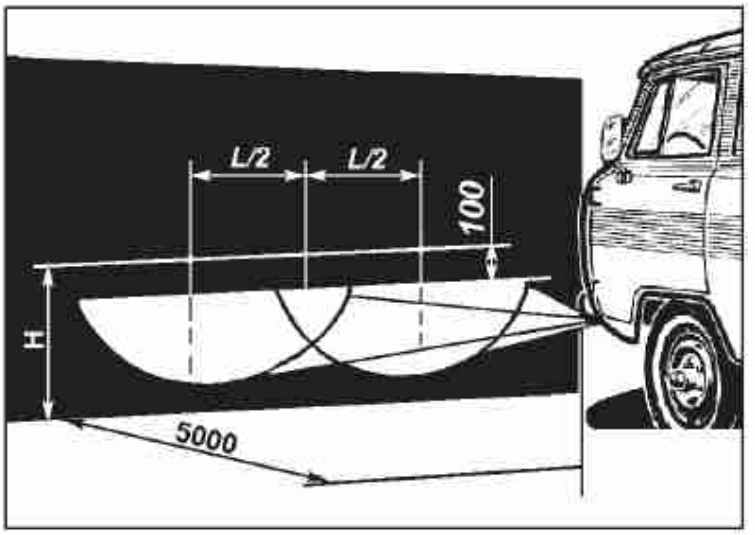


Fig. 9.40. Screen marking for front fog lights adjustment:
H — distance between lights center and ground level;
L — distance between front fog lights centers

Front and rear lamps, backing lamp, side repeaters, rear fog lamp. To replace bulbs undo screws attaching the lens and remove it.

License plate lamps. To replace lamps untwist the cap screw, remove the cap and the lens.

Horn maintenance involves the following: periodically check its attachment and the tightening of wire clamps, clean the horn from dust and dirt and check the sound power, adjusting it as required.

Adjust the horn in a workshop.

Gages and Alarms

Periodically check the tightening of the gages, the safety of their contact couplings. Clean them of dirt and dust.

When removing electric sensors isolate the wires to avoid short circuit. Use a hex socket wrench or a box wrench to remove the coolant temperature sensor and the coolant emergency temperature sensor without damaging their housings.

Check the fluid level in the cooling system radiator; if the fluid level is low, the sensor may come out of order.

Once a year check the accuracy of the coolant sensor reading. To do so, immerse the sensor into hot water, the temperature of which shall be measured with a thermometer.

Once a year check the accuracy of the oil pressure sensor and the sensor of emergency oil pressure lamp with a manometer.

BODYSHELL

Always take preventive care of the bodyshell paint to preserve the vehicle's appearance. Do not clean the surface with dry cloth to avoid scratches. Wash the bodyshell with low-pressure water jet, using a soft cloth.

When washing the bodyshell with such a system as Kärcher, water release to the cab is possible, which is not a vehicle defect.

Wipe dry the washed bodyshell surfaces to avoid stains, appearing after drying-out in summer, and to avoid cracks appearing after water drops freezing. Do not use soda and alkaline solutions, as it leads to paint fading. When possible, do not park the vehicle under direct sunlight to avoid deterioration of wheel tires and weather strips.

Use preventive polishes, such as car emulsions, aerosol polishes, AB-70 wax (for cars), etc. to preserve the bodyshell paint. Use cleaning polishes to restore the shine of the bodyshell faded paint.

During vehicle operation periodically treat the surfaces (especially closed hollows) with anti-corrosion products, such as Movil, Tectil, Nova, etc. to preserve the bodyshell from premature deterioration. Treat the closed bodyshell hollows through the orifices in floor panels and cross members, which are closed by rubber plugs.

As required, recover the bodyshell floor pan, coated with bituminous mastic, by spreading the mastic with a special spray or with a brush.

Periodically lubricate mechanisms and bodyshell fitting parts.

It is strongly recommended to follow the instructions hereof and the Lubrication Service Manual. The grease names are indicated in the Lubricants and Fluids Table (see Appendix 3). It is not allowed to use oils and greases, which are not indicated in the table, and to break greasing intervals.

Methods of assemblies lubrication and grease change are described in the corresponding manual sections.

Within 24 hours after fording check oil in all units. If water is detected in the oil, change the oil in this unit. Grease all lubrication nipples of the chassis until the fresh grease squeezes out.

While greasing follow these rules:

1. Drain oil from the engine and the transmission units immediately after the vehicle stops, while the units are warmed up.

2. Thoroughly remove dirt from the lubrication nipples and plugs before greasing to avoid dirt coming into the vehicle mechanisms.

3. Thoroughly remove escaped grease from all parts after lubrication.

4. If the housings of the engine and the transmission units contain excessively dirty oil, or the oil contains metal particles, wash the housings before filling fresh oil.

5. It is not allowed to mix the engine oils of different brands or of different manufacturers.

When changing the oil brand or oil manufacturer wash the engine lubrication system.

6. Mixing Litol-24 grease with Lita substituting grease is allowed in any proportions. When using other substitutes wash the unit with kerosene.

7. Mixing of the following brake fluids is allowed in any proportions: Rosa, Rosa-3, RosDot, Tom', Rosa Dot-4.

Chapter 10. TOOLS AND APPLIANCES

Each manufactured vehicle is supplied with tools and appliances according to the list, enclosed to the vehicle.

A jack (Fig. 10.1) is applied for lifting vehicle wheels when servicing or repairing. The carrying capacity of the jack is 2 tons. The highest lifting point is 410 mm.

To lift the wheels with the jack do the following:

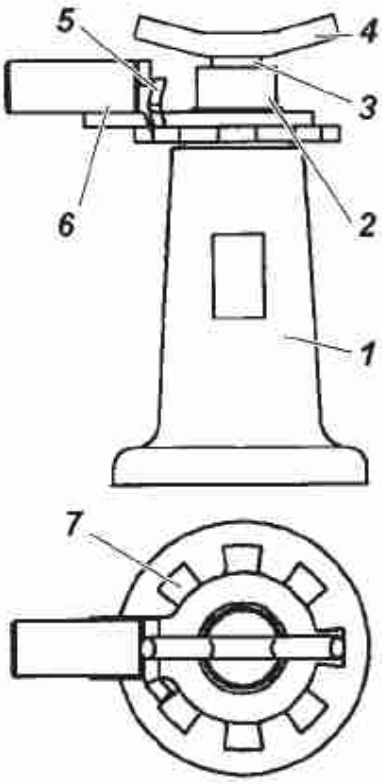


Fig. 10.1. Jack:
1 — housing; 2 — external screw;
3 — internal screw; 4 — head;
5 — pawl; 6 — handle; 7 — ratchet

1. Apply the parking brake, shift into the first or the reverse gear of the gearbox and make sure that the transfer case lever is not in the neutral position. Put wheel wedges under the wheel opposite to the lifted one, as required.

2. Install the jack on a level ground under the axle shaft housing.

3. Untwist jack internal screw 3 as high as the clearance between the axle shaft housing and the ground allows.

4. Move jack pawl 5 to the left from handle 6, so that the pawl end enters the slot of ratchet wheel 7.

5. Lift the vehicle on a required height by swinging the tire lever, inserted to the handle orifice.

6. To lower the wheels move the jack pawl to the right and deepen the jack screws into housing 1 by swingings the tire lever. At the end of work twist external screw 2 and internal screw 3 into the jack housing as far as it can go.

Jack Maintenance: periodically clean threaded parts from dirt and grease them.

Inspect the riveted couplings, screws and levers of jacks. Screws and levers deformation or damage, as well as riveted couplings loosening are not allowed. If so, replace the jack.

Chapter 11. PRESERVATION

If the vehicle is not operated for a long time, preserve it as follows:

1. Carry out the scheduled maintenance.

2. Wash the vehicle and wipe it dry. Remove corrosion and paint areas of damaged paint.

3. Fill each engine cylinder with 30-50 g of hot dehydrated motor oil to prevent them from corrosion. Turn the engine crankshaft for approximately 15 torques to spread oil over the whole surface of cylinders.

4. Clean the electric wiring from dirt and dry it thoroughly.

5. Clean all unpainted exterior metal surfaces and unpainted parts of joint couplings (door hinges, door locks, parking brake drive rods, carburetor control rods, towing gear and other assemblies, spark plugs), and grease them with PVK plastic lubricant (or petroleum jelly instead).

6. Grease the springs with a graphite lubricant.

7. Check and clean tools and appliances, as well as the set of spare parts, wrap everything in oiled paper or cloth.

8. Cover the bodyshell glasses with lightproof paper (cloth) or with shields from the outside.

9. Remove wheels from the vehicle, clean the rims from dirt and paint any damaged areas. Clean, wash and dry tires, bring their pressure to normal.

10. As required, wash the fuel tanks and fuel them up to the max level.

11. Prepare the battery for long preservation, following instructions of the Lead Battery Manual.

12. Cover the air filter inlet tube and the muffler tailpipe with oiled paper.

13. Loosen the tension of ventilator, alternator and water pump drive belts.

14. Drain the fluid from the cooling system, the heater radiator and the windshield washer.

15. Seal housings of the gearbox, transfer case, front and rear axles by wrapping their safety valves in insulating tapes.

16. Cover a gap between the brake shields and the drums with oiled paper.

17. Keep tires and other rubber parts away from direct sunlight.

18. Put metal or wooden stands under the axles, so that the wheels are lifted over the ground.

Release the rear and front springs by putting wooden spacers between the frame and the axles.

Keep the preserved vehicle in a clean and ventilated room with the relative humidity of 40-70 % and at temperature of +5°C at least.

Do not keep the vehicle and poisonous substances (acids, alkali etc) in the same room.

PRESERVED VEHICLE MAINTENANCE

Carry out vehicle maintenance every two months. Do the following:

1. Thoroughly inspect the vehicle from the outside.

2. Screw off the spark plugs, disconnect the power wires from the ignition coil and turn the engine crankshaft for approximately 15 torques after shifting into the first gear of the gearbox and into the reduction gear of the transfer case. Once a year fill the engine cylinders with 30-50 g of engine oil before turning the crankshaft.

3. Clean any damaged areas of corrosion, grease and paint them.

4. Turn the steering wheel to both sides 2-3 times.

5. Check the parking brake and the pedal brake, the clutch, the throttle gate drive and lighting switches.

6. Check fluid level in the tanks of the brake master cylinder. Add the fluid, as required.

7. Check the electrical equipment instruments.

8. Check tools and appliances, wipe and grease them again, as required.

9. Check tires and other rubber parts.

10. Eliminate detected malfunctions.

DEPRESERVATION

1. Remove preservation grease from parts by washing them with kerosene or unleaded gasoline. Thoroughly remove the grease from items, which can contact rubber parts or painted surfaces. Thoroughly wash the spark plugs in unleaded gasoline.

2. Carry out the daily vehicle maintenance.

3. Check oil level in the engine housing. Drain excessive oil.

4. Before starting the engine fill each cylinder with 30-50 g of the motor oil and turn the crankshaft for 10-15 torques.

Chapter 12. TRANSPORTATION

Vehicles can be transported by railway, water or air transport.

When transporting vehicles by water or air transport fasten them in accordance with the water transport shipment scheme or the air transport shipment scheme. Use appliances, which will not damage any parts or painted surfaces.

Vehicles shall be handled by a crane with special grips.

Vehicles shall be placed inside any transport means with the following distance between them: 50-100 mm from the side of the engine cooling radiator, 100 mm from all other sides. The vehicle parking brake is on, the engine is off, the gearbox lever is shifted into the first gear, the battery is disconnected (the cable is disconnected from the battery minus terminal).

Before air transporting the fuel tanks shall be fueled to no more than 75 % of their capacity.

Enter the aircraft in the first gear of the gearbox and in the reduction gear of the transfer case or in the reverse gear.

Chapter 13. UTILIZATION

The vehicle is utilized in accordance with regulations, rules and methods, effective within the area of utilization.

Appendix 1

VEHICLE LAMPS

Lamps	Lamp Type	Power, W
Lamps: high beam and low beam	AKG12-60+55-1(N4)	60x55
Headlamps:		
Parking lamps	A12-5	5
Turn indicators	A12-21-3	21
Rear lamps:		
Turn indicators	A12-21-3	21
Parking lamps	A-12-5	5
Brake indicators	A-12-21-3	21
Turn repeaters	A12-5	5
Reverse lamp	A12-21-3	21
License plate lamp	A12-5	5
Cab light	A12-10	10
Rear fog light	A12-21-3	21
Gages illumination	LED	

Appendix 2

TIGHTENING TORQUE OF MAIN THREADED COUPLINGS, KGF•M

Bolts of crankcase cylinder head (soft gasket of cylinder head)	
pretension holding min. 2 minutes 70-75° angle tightening	6.9–8.2
Bolts of crankcase cylinder head (rigid gasket of cylinder head)	
pretension holding min. 1 minute 90° angle tightening	3.3–3.7
Valve cap bolts	0.5–0.7
Chain cap screws	2.0–2.5
Bolts of front cylinder head cap	1.2–1.8
Attachment of ventilator drive sleeve to hub	5.0–6.0
Bolt between engine front struts and frame brackets	5.0–6.2
Bolts between engine front strut brackets and crankcase	2.8–3.6
Bolt between engine front strut and crankcase bracket	9.0–11.0
Nuts between engine rear struts and brackets with cottering	3.2
Nuts between engine rear struts brackets and frame	2.8–3.6
Crankshaft coupling bolt	17–20
Screws of throttle heating hoses clamps	0.1–0.3
Inlet pipe nuts	2.9–3.6
Exhaust manifold nuts	2.0–2.5
Self-locking nuts of inlet pipe	4.6–5.1
Oil housing bolts	1.2–1.8
Spark plugs	2.1–3.1
Inlet manifold bolts and nuts	2.0–2.5
Starter motor bolts	4.4–5.6
Bolts of cooling system pump pulley	1.4–1.8
Water pump screws	2.0–2.5
Bolt between water pump and chain cap	1.9–2.3
Bolts of engine fuel pipes	0.6–0.9
Screws of throttle inlet tube	1.2–1.8
Thermostat housing screws	2.0–2.5
Steel fuel pipe adapters	2.0–2.5
Clamps of power system rubber hoses	2.5–3.5

Clamps of cooling system hoses	0.4–0.45
Clamps of heating system hoses	0.25–0.35
Cooling system radiator bolts	3.2–3.6
Bolts of idle governor clamp	0.6–0.9
Detonation sensor nut	1.5–2.0
Sensors bolts (camshaft position sensor, crankshaft position sensor)	0.6–0.9
Bolts of timing sensor, absolute pressure sensor and temperature sensor	0.6–0.9
Cooling system temperature sensor	1.2–1.8
Air temperature sensor	1.2–1.8
Oxygen sensor	3.5
Sensor of throttle gate position	0.3
Ignition coil bolts	0.6–0.9
Nuts of bolts in propeller shaft flanges	4.4–5.6
Bolts and nuts of gearbox and transfer case	4.0–5.6
Nut between flange and axle drive gear	17–21
Bolts between axle driven gear and differential case	10–14
Differential carrier bolts	3.6–5.0
Nuts of leaf spring U-bolts	9–10
Nuts of shackle pins (for vehicles w/ABS)	8.5–9.5
Nuts of leaf springs axle (for vehicles w/ABS)	16–18
Wheels nuts	10–12
Bolts of front axle drive flanges and rear axle shafts	6.0–7.0
Nut between drag link and shaft	20–28
Nuts of steering trapezium ball studs	6.0–8.0
Bolts of front disc brake support	14–16
Bolts of rear brake shields	4.4–5.6
Tie rods locknuts	10.5–13.0
Ball struts bolts	3.6–5.0
Locknuts of wheel hubs bearings	2.0–2.5
Pin nut	8.0–10.0

Note — Use the following tightening torque for other threaded couplings:
M6 — (0.45–1.0);
M8 — (1.4–1.8);
M10 — (3.0–3.5) kgf·m.

Appendix 3

LUBRICANTS AND SPECIAL FLUIDS

Place of Lubrication / Filling	Name of Lubricant or Fluid	
	Basic	Foreign
	Engine oil	
Engine lubrication system	SAE 0W-30 — from –30 to +20°C; SAE 0W-40 — from –30 to +25°C; SAE 5W-30 — from –25 to +20°C; SAE 5W-40 — from –25 to +35°C; SAE 10W-30 — from –20 to +30°C; SAE 10W-40 — from –20 to +35°C; SAE 15W-30 — from –15 to +30°C; SAE 15W-40 — from –15 to +45°C; SAE 20W-30 — from –10 to +30°C; SAE 20W-40 — from –10 to +45°C; SAE 30 — from –5 to +40°C; SAE 40 — from 0°C to +45°C as per operating properties: - API classification — min. SG or SG/CD; - AAI (Automotive Engineers Association) classification — min. B4 or B4/D2	
	Transmission oils	
Final drive housings of front and rear axles	For all seasons (with min. temperature of minus 25°C): TSp-15K; TAP-15V; TAD-17I For cold season only (from October, 1 to April, 1) — TSp-10	For all seasons — SAE 75W/90 API classification: GL-5
Steering system housing	For all seasons: TSp-15K; TAP-15V; TAD-17I For cold season only — TSp-10	For all seasons: SAE 85W, SAE 90 API classification: GL-3 For cold season only — SAE 75WAPI classification GL-3

Appendix 3 (continued)

Place of Lubrication / Filling	Name of Lubricant or Fluid	
	Basic	Foreign
* Housing of 4-speed gearbox, housing of transfer case	For all seasons: TSp-15K; TAP-15V; TAD-17I — with min. temperature of 25°C TSp-10 — for cold season only	For all seasons: SAE 85W, SAE 90 API classification: GL-3 For cold season only — SAE 75WAPI classification GL-3
* Housing of 5-speed gearbox, housing of transfer case		For all seasons: SAE75W-85 API classification: GL-4
	Plastic lubricants	
Splines of front and rear propeller shafts, joints of front and rear propeller shafts, bearings of steering column shaft, steering knuckles pins, steering knuckle, bearings of front and rear wheels hubs, front bearing of gearbox driving shaft, bearings of heater electric motor, gearbox control drive, release and adjusting mechanisms of parking brake, parking brake drive cable, battery terminals	For all seasons: Litol-24; Litol-24RK	For all seasons: Lithium grease of NLGJ 3
Steering knuckles joints	SHRUS-4; SHRUS-4M	Retinax HDX2
Door locks, hinges and stops	TSIATIM-201	Centuri 1180
Leaf springs	USSa graphite grease	Lithium grease of NLGJ 3
Rubber weather strips	Graphite powder	Barbatia Grease 2
Guide bushes of front disc brakes	UNIOL 2M-1	

* — gearbox and transfer case shall have the same oil

Appendix 3 (continued)

Place of Lubrication / Filling	Name of Lubricant or Fluid	
	Basic	Foreign
	Operating fluids	
Clutch and brake system hydraulic drives	Brake fluid: Rosa Dot-4; RosDot	SAE 1703F; DOT-4
Engine Cooling System	Coolant: OZH-40, OZH-65 Lena OZH-40, OZH-65 TOSOL-TS, TOSOL A-40M; TOSOL A-65M	Shell safe
Windshield wiper tank	Obzor, Avtoochistitel stekol-2	

Appendix 4

INFORMATION
on Precious Metals in Vehicle Electric Equipment

Manufacturing Type	Item Name	Precious Metal	Weight, g
6232.3827	Fuel level sensor (for vehicles with two fuel tanks)	silver	0.013238
		palladium	0.0046744
		ruthenium	0.00064147
6002.3829	Oil emergency pressure sensor	silver	0.0310
101.3839	Brake fluid emergency level sensor	gold	0.01198
		silver	0.029064
495.374701	Turn indicators contact breaker	silver	0.0208
		palladium	0.112
528.3747-04	Windshield wiper breaker	silver	0.143
379.3710-07.1N	Emergency alarm switch	silver	0.107

CONTENTS

Vehicles:
UAZ-374195, UAZ-396295,
UAZ-390995, UAZ-220695,
UAZ-330365, UAZ-390945

and Versions Thereof

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