

Limited Liability Company «Automobile Plant GAZ»  
(LLC «AVTOZAVOD GAZ»)

**GAZelle**  
**SOBOL**

**VEHICLES FAMILY**

**OPERATING INSTRUCTIONS**

**3302-3902111-10ИЭ**

2<sup>nd</sup> Edition

RUSSIA  
NIZHNIY NOVGOROD  
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## INTRODUCTION

“GAZelle” and “SOBOL” trucks and buses are reliable and comfortable vehicles. 4×2 trucks and buses are designed to be operated over improved roads (4×4 ones – over all types of roads) in different climatic conditions.

“GAZelle” vehicles family presented in this Operating Instructions comprises the following models:

GAZ-3302 – 4×2 type and GAZ-33027 – 4×4 type with three-seat cabin

GAZ-33023 – 4×2 type and GAZ-330273 – 4×4 type with six-seat cabin

GAZ-330202 – long-wheelbase, with three-seat cabin

GAZ-330232 – long-wheelbase, with six-seat cabin

GAZ-2705 – 4×2 type and GAZ-27057 – 4×4 type all-metal vans, with three-or seven-seat cabin

GAZ-3221 – 4×2 type and GAZ-32217 4×4 type buses with 8 (9) passenger seats.

GAZ-32213, GAZ-322132 – 4×2 type and GAZ-322173 – 4×4 type buses with 12 (13) passenger seats

GAZ-32214 – 4×2 type and GAZ-322174 – 4×4 type ambulance vehicles

**Note.** In brackets there is indicated a number of seats when double passenger seat is installed in bus cabin (except for the buses with 12 (13) seats where the cabin has double passenger seat and the rear row of the body is three-or four-seat).

“Sobol” vehicle family presented in this Operating Instructions comprises the following models:

GAZ-2752 – 4×2 type and GAZ-27257 – 4×4 type all-metal vans with low or medium height roof and three-or seven-seat cabin.

GAZ-2217 – 4×2 type and GAZ -22177 – 4×4 type buses with low roof.

GAZ-22171 – 4×2 type and GAZ-221717 – 4×4 type buses with medium-height roof.

The manufacturer reserves the right to constantly alter its vehicle design, therefore some units and parts may slightly differ from those described in this Operating Instructions.

You can surely expect reliable operation of the vehicle provided you observe maintenance schedule specified in this Operating Instructions and Service Book.

## 1. USEFUL HINTS

Vehicles with ZMZ-4063 and ZMZ-40522 engines run on Research Octane Number 92-95 gasoline, with ZMZ-4061 run on Research Octane Number 76 gasoline and with GAZ-560, GAZ-5601, 5602 and Sofim 8140.43 engines – on diesel fuel (see subsection “Equivalents of Fuels, Oils, Lubricants and Fluids”).

Coast when the engine starter key is in position III is strictly prohibited because in this case the steering control might be accidentally locked by the anti-theft device.

It is prohibited to close the doors with the button pushed down into the “Locked” position. It may cause the damage of the lock.

Do not reset trip distance counter when the truck is running since this might cause the damage of the counter.

After engine<sup>1)</sup> washing in cold weather it is necessary to warm it up for 5–10 minutes at different speed to remove water from toothed pulleys and camshaft drive belt.

Do not run the engine<sup>1)</sup> when alternator drive belt is loose for it will cause the sharp decrease of braking efficiency.

For liquid coolant draining the hose is fitted to monoblock<sup>1)</sup> cock. Without the hose liquid coolant will not drain fully from the monoblock.

To avoid camshaft toothed timing belt slipping that leads to damage of valve timing gear parts, do not throw hot water on the engine<sup>1)</sup> to facilitate its starting.

To avoid oil leakage from GAZ-560, GAZ-5601, 5602 engines through the seals, do not disconnect crankcase ventilation system hose from the intake pipe.

When engine runs do not keep the steering wheel turned as far as it will go for more than 15 sec because it may cause the damage of power steering<sup>2)</sup> pump.

Do not start the engine when the level of oil in power steering<sup>2)</sup> tank is not sufficient.

The exhaust system of the vehicles with ZMZ-40522 engine is equipped with catalyst converter (mounted on some of the vehicles).

To ensure the proper operation of the converter it is necessary to use unleaded gasoline with Research Octane Number 92, only.

The converter can also go out of order when the ignition system of the engine misfires, because in this case the gasoline that failed to burn will enter

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<sup>1)</sup> For GAZ-560, GAZ-5601, 5602.

<sup>2)</sup> For vehicles with power steering.

the converter increasing sharply the temperature inside it and in its turn it will cause appearing of cracks in its ceramic block.

During the operation the converter becomes very hot. Therefore when parking the vehicle be sure that there is no combustible material (dry grass, wiping waste, chip etc.) under the converter.

Never start the engine by towing the vehicle to prevent damaging of the converter.

When starting cold engine (ZMZ-4063) it is necessary to step on the accelerator pedal, close the choke and release the accelerator pedal. On violating of the above stated sequence the carburetor choke rod possibly be broken.

To prevent damaging of the gearbox when towing the vehicle by its partial loading, disconnect the propeller shaft flange from the axle drive. Then fix reliably the disconnected end of the propeller shaft via a wooden block to the bracket cross-bar of parking brake system linkage cable equalizer arm.

On the vehicles with ZMZ-40522 engine fuel tank contacts with atmosphere by means of gasoline vapour recovery system (mounted on some of the vehicles). It consists of steam pipes and valves such as safety valve and pressure-vacuum control valve, as well as adsorber (adsorbs gasoline vapour) with electromagnetic valve of blowing.

To avoid fire dangerous situation and damaging of the adsorber when fuel gets into it, fuel tank design insures fuel cut-off during fuelling. Forced filling of extra fuel is not allowed.

## 2. VEHICLE IDENTIFICATION DATA

Identification number of the vehicle (VIN) and identification numbers of cabin or all-metal body, engine and cargo body vehicle chassis refer to the vehicle identification data.

**Vehicle Identification Number (VIN) on the vans with all-metal cargo body and buses** appears on the cab front outer panel under the hood on the right side in direction of vehicle movement (see Fig. 2.1, arrow “A” view);

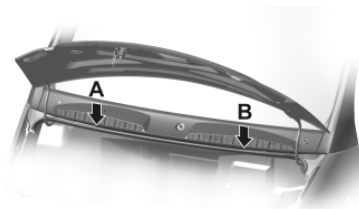


Fig. 2.1. A – location of vehicles VIN; B – location of cab number (vehicles with cargo body) or body number (vans, buses).

**Vehicle Identification Number (VIN) on the vehicles with cargo body** appears on the right side member before the rear spring front bracket (Fig. 2.2).

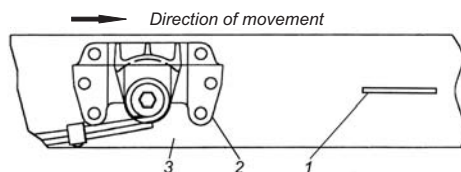


Fig. 2.2. Location of VIN on the vehicles with cargo body and chassis:

1 – location of identification number; 2 – rear spring front bracket; 3 – frame side member, right

Example of Vehicle Identification Number:

★X96★33020050140794★, where:

X96 – manufacturer international identification code,  
330200 – “GAZelle” vehicle model,  
221710 – “Sobol” vehicle model  
5 – model year code (5 – 2005, 6 – 2006),  
0140794 – vehicle serial number.

**Model year** is a period equal on the average to calendar year during which the vehicles with identical design features are being manufactured.

**Cab number (vehicles with cargo body) or body number (vans and buses)** is located on the front outer panel under the hood, on the left in direction of vehicle movement (see Fig. 2.1, arrow “B” view).

Example of Body (Cab) Number:

★27050040100125★, where:

270500 – “GAZelle” body index,

330200 – “GAZelle” cabin index

22171 – “Sobol” body index

5 – model year code,

0100125 – body (cabin) serial number.

**ZMZ Engine identification number** is stamped on the cylinder block on the left side (see Fig. 2.3).

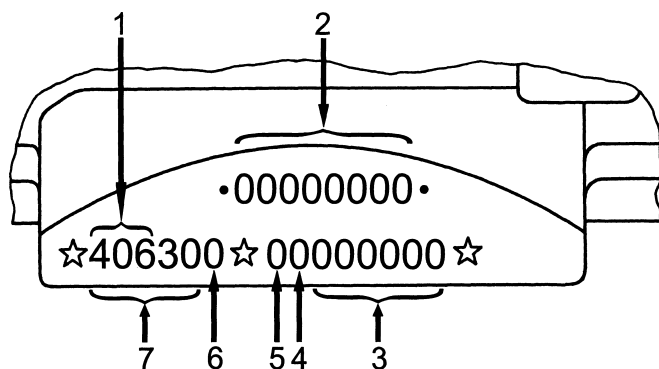


Fig. 2.3 Engine identification number

1 – engine model; 2 – cylinder block number; 3 – engine serial number; 4 – engine manufacturer code; 5 – model year code; 6 – engine variant code; 7 – engine version

**Identification number of cylinder block** is punched above the engine identification number.

**Identification number of GAZ-560, GAZ-5601, 5602 engines** (Fig. 2.4) is stamped on the plain surface of engine framework (in its front part, on the right, above alternator mounting flange). It contains engine index (GAZ-560 or GAZ-5601, 5602), model year code (5 – 2005; 6 – 2006) and engine serial number.

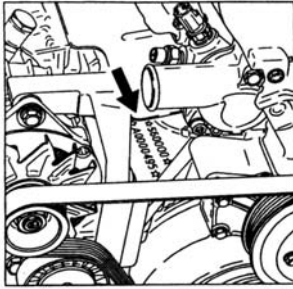


Fig. 2.4. Identification Number of  
GAZ-560, GAZ-5601, 5602 Engines

**Identification number of Sofim 8140.43C engine** (Fig. 2.5) is punched on the plane surface of the cylinder block in the rear part of the engine at the right side.

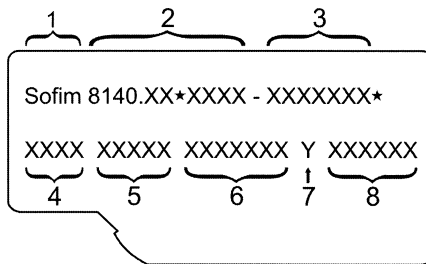


Fig. 2.5. Identification Number of Sofim  
8140.43C Engine

1 – engine manufacturer; 2 – engine variant code; 3 – engine number; 4 – diameter of cylinder; 5 – diameter of main bearings; 6 – certificate; 7 – engine manufacturer code; 8 – the last six digits of engine number.

**Vehicle identification data** also appears on manufacture's plate (Fig. 2.6 and 2.7) located on the rear pillar of the cab side panel.

|                             |     |
|-----------------------------|-----|
| LLC "AUTOMOBILE PLANT "GAZ" |     |
| X96 33020050140794          | ← a |
| 3500 кг                     | ← b |
| - кг                        | ← c |
| 1- 1400 кг                  | ← d |
| 2- 2500 кг                  | ← e |
| ENGINE 40630F               | ← f |

Fig. 2.6. Example of "GAZelle" Vehicle  
Manufacture's Plate with Identification  
Data

|                             |     |
|-----------------------------|-----|
| LLC "AUTOMOBILE PLANT "GAZ" |     |
| X96 22170050140794          | ← a |
| 2900 кг                     | ← b |
| - кг                        | ← c |
| 1- 1400 кг                  | ← d |
| 2- 1620 кг                  | ← e |
| ENGINE 40630F               | ← f |

Fig. 2.7. Example of "Sobol" Vehicle  
Manufacture's Plate with Identification  
Data

- a** – vehicle identification number;
- b** – gross vehicle weight;
- c** – gross vehicle weight with trailer;
- d** – maximum front axle weight;
- e** – maximum rear axle weight;
- f** – engine index

### 3. SPECIFICATIONS

#### 3.1. GENERAL DATA

##### 3.1.1. “GAZelle” General Data

###### Trucks

| Vehicle model                   | GAZ-3302                     | GAZ-330202 | GAZ-33023 | GAZ-330232 | GAZ-2705                    | GAZ-33027     | GAZ-330273 | GAZ-27057                   |
|---------------------------------|------------------------------|------------|-----------|------------|-----------------------------|---------------|------------|-----------------------------|
| Type                            | Biaxial with rear axle drive |            |           |            |                             | 4 × 4 biaxial |            |                             |
| Vehicle gross mass, kg          | 3500                         | 3500       | 3500      | 3500       | 3500                        | 3500          | 3500       | 3500                        |
| Vehicle kerb mass, kg:          |                              |            |           |            |                             |               |            |                             |
| – with engines                  |                              |            |           |            |                             |               |            |                             |
| ZMZ-4061, 4063,<br>40522        | 1850                         | 2100       | 2050      | 2170       | 2000/<br>2090 <sup>1)</sup> | 2100          | 2300       | 2220/<br>2310 <sup>1)</sup> |
| – with engine                   |                              |            |           |            |                             |               |            |                             |
| GAZ-560                         | 1900                         | 2150       | 2100      | 2200       | 2050/<br>2140 <sup>1)</sup> | 2150          | 2350       | 2270/<br>2360 <sup>1)</sup> |
| – with engine                   |                              |            |           |            |                             |               |            |                             |
| GAZ-5601, 02                    | 1950                         | 2200       | 2150      | 2270       | 2140/<br>2190 <sup>1)</sup> | 2200          | 2400       | 2360/<br>2410 <sup>1)</sup> |
| – with Sofim engine             |                              |            |           |            |                             |               |            |                             |
|                                 | 1950                         | 2200       | 2150      | 2270       | 2100/<br>2190 <sup>1)</sup> | 2200          | 2400       | 2320/<br>2410 <sup>1)</sup> |
| Overall dimensions,<br>mm:      |                              |            |           |            |                             |               |            |                             |
| – length                        | 5510                         | 6616       | 5510      | 6295       | 5540                        | 5570          | 5570       | 5600                        |
| – width                         | 2095                         | 2095       | 2095      | 2095       | 2075                        | 2095          | 2095       | 2075                        |
| – height <sup>2)</sup>          | 2120                         | 2120       | 2275      | 2275       | 2200                        | 2200          | 2355       | 2300                        |
| – height over canvas<br>top, mm | 2570                         | 2570       | 2570      | 2570       | —                           | 2660          | 2660       | —                           |

<sup>1)</sup> For vans with two rows of seats.

<sup>2)</sup> Height over cab is given for the vehicles with the cargo body.

| Vehicle model                                                                   | GAZ-3302 | GAZ-330202 | GAZ-33023 | GAZ-330232 | GAZ-2705 | GAZ-33027 | GAZ-330273 | GAZ-27057 |
|---------------------------------------------------------------------------------|----------|------------|-----------|------------|----------|-----------|------------|-----------|
| Wheelbase, mm                                                                   | 2900     | 3500       | 2900      | 3500       | 2900     | 2900      | 2900       | 2900      |
| Front wheels track, mm                                                          | 1700     | 1700       | 1700      | 1700       | 1700     | 1720      | 1720       | 1720      |
| Rear wheels track (between centres of twin tyres), mm                           | 1560     | 1560       | 1560      | 1560       | 1560     | 1560      | 1560       | 1560      |
| Ground clearance (under rear axle housing at total mass), mm                    | 170      | 170        | 170       | 170        | 170      | 190       | 190        | 190       |
| Minimum turning radius (front outer track), m                                   | 5.5      | 6.7        | 5.5       | 6.7        | 5.5      | 7.5       | 7.5        | 7.5       |
| Maximum speed, km/h, on flat, smooth highway, not less than, for vehicles with: |          |            |           |            |          |           |            |           |
| — ZMZ-4061, 4063 engine                                                         | 115      | 115        | 115       | 115        | 115      | 115       | 100        | 100       |
| — ZMZ-40522 engine                                                              | 130      | 130        | 130       | 130        | 130      | 130       | 130        | 130       |
| — GAZ-560 engine                                                                | 115      | 115        | 115       | 115        | 115      | 100       | 100        | 100       |
| — GAZ-5601, 5602 engine                                                         | 120      | 120        | 120       | 120        | 120      | 120       | 115        | 115       |
| — Sofim 8140.43C engine                                                         | 120      | 120        | 120       | 120        | 120      | 120       | —          | —         |
| Overhang angles (laden), deg.:                                                  |          |            |           |            |          |           |            |           |
| — front                                                                         | 24       | 24         | 24        | 24         | 22       | 22        | 28         | 28        |
| — rear                                                                          | 24       | 17.5       | 24        | 23         | 18       | 18        | 26         | 20        |

| Vehicle model                                    | GAZ-3302 | GAZ-330202 | GAZ-33023 | GAZ-330232 | GAZ-2705          | GAZ-33027         | GAZ-330273 | GAZ-27057         |
|--------------------------------------------------|----------|------------|-----------|------------|-------------------|-------------------|------------|-------------------|
| Maximum climable gradient for laden vehicle, %   | 26       | 26         | 26        | 26         | 26                | 30                | 30         | 30                |
| Cargo body (van) loading height, mm              | 950      | 950        | 950       | 950        | 725               | 725               | 1040       | 825               |
| Van freight compartment capacity, m <sup>3</sup> | —        |            | —         |            | 9/6 <sup>1)</sup> | 9/6 <sup>1)</sup> | —          | 9/6 <sup>1)</sup> |
| Cargo body overall dimensions (inner), mm:       |          |            |           |            |                   |                   |            |                   |
| — length                                         | 3089     | 4168       | 2339      | 3089       |                   |                   |            |                   |
| — width                                          | 1978     | 1978       | 1978      |            |                   |                   |            |                   |
| — height                                         | 400      | 400        | 400       | 400        |                   |                   |            |                   |

<sup>1)</sup> For vans with two rows of seats.

## Buses and Ambulances

| Vehicle model                         | GAZ-3221                     | GAZ-32213 | GAZ-32214                                        | GAZ-32217                  | GAZ-322173    | GAZ-322174         |
|---------------------------------------|------------------------------|-----------|--------------------------------------------------|----------------------------|---------------|--------------------|
| Type                                  | With all-metal body          |           |                                                  |                            |               |                    |
| Vehicle gross mass <sup>1)</sup> , kg | Biaxial with rear axle drive |           |                                                  |                            | 4 x 4 biaxial |                    |
|                                       | 3250                         | 3500      | 3500<br>3550 <sup>2)</sup><br>3500 <sup>3)</sup> | 3470<br>3760 <sup>2)</sup> | 3720          | 3500               |
| Vehicle kerb mass, kg:                |                              |           |                                                  |                            |               |                    |
| – with engines ZMZ-4061, 4063, 40522  | 2500                         | 2440      | 2600                                             | 2720                       | 2660          | 2870               |
| – with engine GAZ-560                 | 2450                         | 2390      | 2650                                             | 2770                       | 2710          | 2920               |
| – with engine GAZ-5601, 5602          | 2500                         | 2440      | 2700                                             | 2820                       | 2760          | 2970               |
| – with Sofim engine                   | 2500                         | 2440      | 2750                                             | 2820                       | 2760          | 2970               |
| Overall dimensions, mm:               |                              |           |                                                  |                            |               |                    |
| – length                              | 5540                         | 5540      | 5550                                             | 5600                       | 5600          | 5560               |
| – width                               | 2075                         | 2075      | 2075                                             | 2075                       | 2075          | 2075               |
| – height                              | 2200                         | 2200      | 2500 <sup>4)</sup>                               | 2300                       | 2300          | 2580 <sup>4)</sup> |
| Wheelbase, mm                         | 2900                         | 2900      | 2900                                             | 2900                       | 2900          | 2900               |
| Front wheels track, mm                | 1700                         | 1700      | 1700                                             | 1720                       | 1720          | 1720               |

<sup>1)</sup> – Gross mass of the buses is specified including driver and passengers as per number of mounted seats.

<sup>2)</sup> – For vehicles with engines GAZ-560, GAZ-5601, 5602.

<sup>3)</sup> – For vehicles with Sofim 8140.43 engines.

<sup>4)</sup> – Height is specified over Signaling and Loudspeaker System.

| Vehicle model                                                         | GAZ-3221                               | GAZ-32213                              | GAZ-32214                              | GAZ-32217                              | GAZ-322173                             | GAZ-322174                             |
|-----------------------------------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| Rear wheels track<br>(between the centres<br>of twin tyres), mm       | 1560                                   | 1560                                   | 1560                                   | 1560                                   | 1560                                   | 1560                                   |
| Ground clearance<br>(under rear axle<br>housing at total<br>mass), mm | 170                                    | 170                                    | 170                                    | 190                                    | 190                                    | 190                                    |
| Minimum turning<br>radius (front outer<br>track), m                   | 5.5                                    | 5.5                                    | 5.5                                    | 7.5                                    | 7.5                                    | 7.0                                    |
| Maximum speed,<br>km/h, on flat,<br>smooth highway,<br>not less than  | 115 <sup>1)</sup><br>120 <sup>2)</sup> | 115 <sup>1)</sup><br>120 <sup>2)</sup> | 115 <sup>1)</sup><br>120 <sup>2)</sup> | 110 <sup>1)</sup><br>115 <sup>2)</sup> | 110 <sup>1)</sup><br>115 <sup>2)</sup> | 110 <sup>1)</sup><br>115 <sup>2)</sup> |
| Overhang angles<br>(laden), deg.:                                     |                                        |                                        |                                        |                                        |                                        |                                        |
| — front                                                               | 22                                     | 22                                     | 22                                     | 28                                     | 28                                     | 28                                     |
| — rear                                                                | 18                                     | 18                                     | 18                                     | 20                                     | 20                                     | 20                                     |
| Maximum climbable<br>gradient for laden<br>vehicle, %                 | 26                                     | 26                                     | 26                                     | 30                                     | 30                                     | 30                                     |

<sup>1)</sup> For vehicles with ZMZ-4061, 4063, 40522, GAZ-560 engines.

<sup>2)</sup> For vehicles with GAZ-5601, 5602 and Sofim engines.

### 3.1. “SOBOL” GENERAL DATA

| Vehicle model                                                | GAZ-2752                | GAZ-27527               | GAZ-2217                | GAZ-22177               | GAZ-22171               | GAZ-221717              |
|--------------------------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Type                                                         | All-metal van           |                         | Bus                     |                         |                         |                         |
|                                                              | 4×2                     | 4×4                     | 4×2                     | 4×4                     | 4×2                     | 4×4                     |
| Vehicle gross mass, kg                                       |                         |                         |                         |                         |                         |                         |
| – with engines                                               |                         |                         |                         |                         |                         |                         |
| ZMZ-4063, ZMZ-40522                                          | 2800                    | 3000                    | 2800/2980 <sup>1)</sup> | 3000/3170 <sup>1)</sup> | 2800/2980 <sup>1)</sup> | 3000/3170 <sup>1)</sup> |
| – with engine GAZ-560                                        | 2800                    | 3000                    | 2850/3030 <sup>1)</sup> | 3020/3200 <sup>1)</sup> | 2850/3030 <sup>1)</sup> | 3020/3200 <sup>1)</sup> |
| – with engine GAZ-5601, 02                                   | 2800                    | 3000                    | 2900/3080 <sup>1)</sup> | 3070/3250 <sup>1)</sup> | 2900/3080 <sup>1)</sup> | 3070/3250 <sup>1)</sup> |
| Vehicle kerb mass, kg:                                       |                         |                         |                         |                         |                         |                         |
| – with engines                                               |                         |                         |                         |                         |                         |                         |
| ZMZ-4063, ZMZ-40522                                          | 1880/1970 <sup>2)</sup> | 2130/2220 <sup>2)</sup> | 2130/2145 <sup>1)</sup> | 2370                    | 2150/2120 <sup>1)</sup> | 2370                    |
| – with engine GAZ-560                                        | 1930/2020 <sup>2)</sup> | 2180/2270 <sup>2)</sup> | 2180                    | 2420                    | 2180                    | 2420                    |
| – with engine GAZ-5601, 02                                   | 1980/2070 <sup>2)</sup> | 2230/2320 <sup>2)</sup> | 2290                    | 2470                    | 2290                    | 2470                    |
| Overall dimensions, mm:                                      |                         |                         |                         |                         |                         |                         |
| – length                                                     | 4840                    | 4910                    | 4840                    | 4910                    | 4840                    | 4910                    |
| – width                                                      | 2075                    | 2075                    | 2075                    | 2075                    | 2075                    | 2075                    |
| – height <sup>2)</sup>                                       | 2100/2200 <sup>3)</sup> | 2170/2300 <sup>3)</sup> | 2100                    | 2200                    | 2200                    | 2300                    |
| Wheelbase, mm                                                | 2760                    | 2760                    | 2760                    | 2760                    | 2760                    | 2760                    |
| Front wheels track, mm                                       | 1700                    | 1720                    | 1700                    | 1720                    | 1700                    | 1720                    |
| Rear wheels track, mm                                        | 1700                    | 1700                    | 1700                    | 1700                    | 1700                    | 1700                    |
| Ground clearance (under rear axle housing at total mass), mm | —                       | 205                     | —                       | 205                     | —                       | 205                     |

<sup>1)</sup> For 10-passenger seat buses.

<sup>2)</sup> For vans with two rows of seats.

<sup>3)</sup> For vans with medium-height roof.

| Vehicle model                                                                   | GAZ-2752 | GAZ-27527 | GAZ-2217 | GAZ-22177 | GAZ-22171 | GAZ-221717 |
|---------------------------------------------------------------------------------|----------|-----------|----------|-----------|-----------|------------|
| Ground clearance (under front suspension arms at total mass), mm                | 150      | —         | 150      | —         | 150       | —          |
| Minimum turning radius (front outer track), m                                   | 5.5      | 6.0       | 5.5      | 6.0       | 7.5       | 6.0        |
| Maximum speed, km/h, on flat, smooth highway, not less than, for vehicles with: |          |           |          |           |           |            |
| — ZMZ-4061, 4063, 40522 engine                                                  | 120      | 110       | 120      | 110       | 120       | 110        |
| — GAZ-560 engine                                                                | 120      | 110       | 120      | 110       | 120       | 110        |
| — GAZ-5601, 5602 engine                                                         | 120      | 120       | 120      | 120       | 120       | 120        |
| Overhang angles (laden), deg.:                                                  |          |           |          |           |           |            |
| — front                                                                         | 22       | 28        | 22       | 28        | 22        | 28         |
| — rear                                                                          | 21       | 30        | 21       | 30        | 21        | 30         |
| Maximum climbable gradient for laden vehicle, %                                 | 29       | 30        | 29       | 30        | 29        | 30         |
| Van loading height, mm                                                          | 670      | 770       | —        | —         | —         | —          |

## 3.2. ENGINE

### 3.2.1. Gasoline Engines

| Model                                                        | ZMZ-405220☐                             | ZMZ-40610☐           | ZMZ-40630☐    |
|--------------------------------------------------------------|-----------------------------------------|----------------------|---------------|
| Type                                                         | 4-stroke, injection                     | 4-stroke, carburetor |               |
| Number of cylinders and their arrangement                    | 4, in-line                              | 4, in-line           | 4, in-line    |
| Cylinder bore and piston stroke, mm                          | 95.5×86                                 | 92×86                |               |
| Displacement, l                                              | 2.464                                   | 2.285                |               |
| Compression ratio                                            | 9.3                                     | 8.0                  | 9.3           |
| Rated power, net, kW (h.p.)                                  | 106.6 (145)                             | 64.8 (88)            | 72.2 (98)     |
| Max. torque, net, daN·m (kgf·m)                              | 20.79 (21.2)                            | 16.8 (17.0)          | 17.2 (17.5)   |
| — at the engine speed, rpm                                   | 4200±200                                | 3500                 |               |
| Engine idle speed, rpm                                       |                                         |                      |               |
| — minimum ( $n_{\min.xx}$ )                                  | 850±50                                  | 750±50               |               |
| — increased ( $n_{\text{incr}^{xx}}$ )                       | 3150±50                                 | 2750±50              |               |
| Fuel grade                                                   | “Regular-92”                            | A-76                 | АИ-93, А-92   |
| Cylinders firing order                                       | 1 – 3 – 4 – 2                           | 1 – 3 – 4 – 2        | 1 – 3 – 4 – 2 |
| Direction of crankshaft rotation (looking from the fan side) | Right-hand                              | Right-hand           | Right-hand    |
| Fuel supply system                                           | With liquid heating of air-fuel mixture |                      |               |
| Carburetor                                                   | —                                       | K-151Д               |               |

### 3.2.2. Diesel Engines

| Model                                     | GAZ-560                                      | GAZ-5601, GAZ-5602            | Sofim 8140.43C <sup>1)</sup> |
|-------------------------------------------|----------------------------------------------|-------------------------------|------------------------------|
| Type                                      | Diesel, 4-stroke, with boost-pressure charge |                               | Diesel, 4-stroke             |
|                                           | Without supercharged air cooling             | With supercharged air cooling |                              |
| Number of cylinders and their arrangement | 4, in-line                                   | 4, in-line                    | 4, in-line                   |
| Cylinder bore and piston stroke, mm       |                                              | 85×94                         | 94.4×100                     |
| Displacement, l                           |                                              | 2.134                         | 2.8                          |
| Compression ratio                         |                                              | 20.5                          | 18.5                         |

☐— Symbol substituting the letter of engine version.

<sup>1)</sup> For “GAZelle” vehicles.

|                                                              |                                                                                               |             |                                                                |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------|
| Rated power, net, kW (h.p.)                                  | 70.0 (95)                                                                                     | 81.0 (110)  | —                                                              |
| Engine speed at rated power, min <sup>-1</sup>               | 3800                                                                                          | 3600        | —                                                              |
| Max. torque, net, daN·m (kgf·m)                              | 20.0 (20.4)                                                                                   | 25.0 (25.5) | 25.0 (25.5)                                                    |
| — at engine speed, rpm                                       | 2300                                                                                          | 2000        | —                                                              |
| Maximum power, kW (h.p.)                                     | —                                                                                             | —           | 78 (106.1)                                                     |
| Engine idle speed, rpm                                       | —                                                                                             | —           | —                                                              |
| — minimum ( $n_{\min. xx}$ )                                 | —                                                                                             | —           | 800±25                                                         |
| — increased ( $n_{\text{incr. } xx}$ )                       | —                                                                                             | —           | 4200±50                                                        |
| Fuel grade                                                   | Diesel fuel                                                                                   |             |                                                                |
| Cylinders firing order                                       | 1—3—4—2                                                                                       |             |                                                                |
| Direction of crankshaft rotation (looking from the fan side) | Right-hand                                                                                    |             |                                                                |
| Fuel supply system                                           |                                                                                               |             | Multi-point with distributor fuel injection pump and injectors |
| Pump-and-injector units                                      | 590/1                                                                                         |             | —                                                              |
| Turbo-compressor                                             | C12 or KO4                                                                                    |             | —                                                              |
| Glow plugs                                                   | 0100226227 «Beru» or<br>0250 202.022 «Bosch» or<br>11721659 «AET» or<br>ИЮМА.387524 ФГУП УАПО |             | —                                                              |
| Governor                                                     | —                                                                                             | —           | Mechanical, all-speed                                          |
| High pressure fuel pump (HPFP)                               | —                                                                                             | —           | Bosch (type VE)                                                |

### 3.3. TRANSMISSION

|                             |                                                                                                                                        |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Clutch                      | Single-plate, dry, with hydraulic drive                                                                                                |
| Gearbox                     | Mechanical, 5-gears, with synchro-mesh unit in all gears                                                                               |
|                             | Transmission ratios:                                                                                                                   |
|                             | — 1 <sup>st</sup> gear – 4.05                                                                                                          |
|                             | — 2 <sup>nd</sup> gear – 2.34                                                                                                          |
|                             | — 3 <sup>d</sup> gear – 1.395                                                                                                          |
|                             | — 4 <sup>th</sup> gear – 1.0                                                                                                           |
|                             | — 5 <sup>th</sup> gear – 0.849                                                                                                         |
|                             | — reverse gear – 3.51                                                                                                                  |
| Transfer case <sup>1)</sup> | Mechanical, with two gears: high gear ( $i = 1.07$ ) and underdrive ( $i = 1.87$ ) and equalizing central controlled slip differential |

<sup>1)</sup> For vehicles type 4×4

|                          |                                                                                                                                                                                 |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cardan drive<br>nee-     | Two shafts with three universal joints (with<br>dle bearings) and intermediate support.<br>Three shafts <sup>1)</sup> with six open type cardan joints,<br>with needle bearings |
| Front axle <sup>1)</sup> |                                                                                                                                                                                 |
| – final drive            | Hypoid, transmission ratio is 5.125                                                                                                                                             |
| – differential           | Bevel, gear-type                                                                                                                                                                |
| – steering knuckles      | With Hook's joints                                                                                                                                                              |
| Rear axle                |                                                                                                                                                                                 |
| – final drive            | Hypoid, transmission ratio is 5.125 <sup>3)</sup> (4.556) <sup>2)</sup> , (4.1) <sup>4)</sup>                                                                                   |
| – differential           | Bevel, gear-type                                                                                                                                                                |
| – axle shafts            | Full floating                                                                                                                                                                   |

### 3.4. RUNNING GEAR

#### 3.4.1. "GAZelle" Vehicles

|                 |                                                                                                             |
|-----------------|-------------------------------------------------------------------------------------------------------------|
| Wheels          | Disk type with solid rim 5S $\frac{1}{2}$ × 16H2                                                            |
| Tyres           | Pneumatic, radial, with tube, size 175R16C or<br>185/75R16C (195R16C) <sup>5)</sup>                         |
| Suspension:     |                                                                                                             |
| – front         | Two longitudinal semielliptic springs                                                                       |
| – rear          | Two longitudinal semielliptic springs with hel-<br>per springs <sup>5)</sup> and antiroll bar <sup>6)</sup> |
| Shock absorbers | Four pcs. – hydraulic, telescopic, dual acting.<br>Mounted on the front and rear axles                      |

#### 3.4.1. "Sobol" Vehicles

|             |                                                                                                                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wheels      | Steel, pressed, disk type with solid rim 6J×16H2                                                                                                                                                               |
| Tyres       | Pneumatic, radial, with tube, 225/75R16 <sup>1)</sup> or<br>215/60R16 or 215/65R16 – for buses or 215/65R16,<br>185/75R16C (for GAZ-2310, GAZ-2752)                                                            |
| Suspension: |                                                                                                                                                                                                                |
| – front     | Wishbone-type independent suspension with<br>cylindrical springs and lateral stabilizer; shock<br>absorbers – filled with gas, telescopic, dual acting.<br>Two <sup>1)</sup> longitudinal semielliptic springs |

<sup>1)</sup> For vehicles type 4×4.

<sup>2)</sup> For "GAZelle" vehicles with ZMZ-40522, GAZ-5601, 5602 engines and "Sobol" vehicles.

<sup>3)</sup> For "Sobol 4×4" vehicles and "GAZelle" vehicles with ZMZ-4061, 4063 and GAZ-560 engines.

<sup>4)</sup> For vehicles with Sofim engine.

<sup>5)</sup> Except for 4×2 type buses.

<sup>6)</sup> Optional.

— rear

Two longitudinal semielliptic springs with lateral stabilizer; shock absorbers – hydraulic, telescopic, dual acting

### 3.5. STEERING GEAR

Steering gear without power steering

Mechanical, “screw-ball nut” type

Steering gear with power steering

Integral type, “screw-ball nut”

Power steering pump

IIIHKΦ 453471115-40 for Sofim engine,

Power steering pump

ZF firm product

Steering gear transmission ratio (in the middle part)

23.09 (for vehicles without power steering), 17.3 (for vehicles with power steering)

### 3.6. BRAKE SYSTEMS

Service brake system

Double-circuit, with hydraulic drive and vacuum booster

Brake gears:

— front wheels

Disk

— rear wheels

Drum

Emergency brake system

Each circuit of service brake system

Parking brake system

With mechanical cable drive to rear wheel brake gears

### 3.7. ELECTRICAL EQUIPMENT

Type

Direct current, single wire. Negative terminals of electrical equipment elements are connected to frame

Rated voltage, V

12

Alternator

— for engines ZMZ-4061,

ZMZ-4063, ZMZ-40522

9422.3701 or 2502.3771

— for engines GAZ-560,

GAZ-5601, 5602

Bosch 6 033 GB001

Starter:

— for engines ZMZ-4061,

ZMZ-4063, ZMZ-40522

6012.3708000 or 4216.3708000-07 or 406.3708000

— for engines GAZ-560,

GAZ-5601, 5602

Bosch 0 001 109042 or Iskra Avtoelektrika AZE 2573

ZMZ-4061, ZMZ-4063

engine control system:

— control unit

243.3763-01 or 309.3763-01 or 243.3763-21 or 309.3763-02<sup>1)</sup>

<sup>1)</sup> — With the function of fan electric coupling relay control.

|                                                                                     |                                                                                                                                  |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| – timing sensor                                                                     | 0261210113 <sup>1)</sup> or 23.3847 or ДС-1                                                                                      |
| – absolute pressure sensor                                                          | 45.3829 or 0261230037 <sup>1)</sup>                                                                                              |
| – coolant temperature sensor                                                        |                                                                                                                                  |
| (engine control system sensor)                                                      | 19.3828 or 405226                                                                                                                |
| – knock sensor                                                                      | 0261231046 <sup>1)</sup> or GT 305 or 18.3885                                                                                    |
| ZMZ-40522 engine control system:                                                    |                                                                                                                                  |
| – control unit                                                                      | 241.3763-64                                                                                                                      |
| – mass airflow sensor                                                               | 20.3855                                                                                                                          |
| – air throttle position sensor                                                      | 0 280 122 001 <sup>1)</sup> or HPK 1-8                                                                                           |
| – oxygen sensor                                                                     | 5WK91000                                                                                                                         |
| – phase sensor                                                                      | 0 232 103 006 <sup>1)</sup> , 406.3847050-01 or ДФ-1                                                                             |
| – engine speed and timing sensor                                                    | 0 261 210 113 <sup>1)</sup> or 23.3847 or ДС-1                                                                                   |
| – inlet pipeline air temperature sensor, coolant temperature sensor                 | 19.3828 or 405226                                                                                                                |
| – knock sensor                                                                      | 0 261 231 046 <sup>1)</sup> , GT-305 or 18.3855                                                                                  |
| – engine idle run governor                                                          | 0 280 140 545 <sup>1)</sup> or PXX-60                                                                                            |
| – electromagnetic nozzles                                                           | 0 280 150 711 <sup>1)</sup> , 0280 150 560 <sup>1)</sup> or ZMZ DEKA<br>IA 9261 <sup>2)</sup> , DEKA ID (ZMZ 6354) <sup>2)</sup> |
| GAZ-560, GAZ-5601, 5602 engines fuel supply control system:                         |                                                                                                                                  |
| – control unit                                                                      | 2176814/2 (for GAZ-560)<br>2176824/0 (for GAZ-5601)<br>220.4001/0 (for GAZ-5602)                                                 |
| – accelerator pedal position sensor                                                 | 2176830/3                                                                                                                        |
| – engine speed sensor                                                               | 2176734/2                                                                                                                        |
| – boost air pressure sensor                                                         | 2203662/1                                                                                                                        |
| – air temperature sensor                                                            | 2174425/2 or ИЦФР 405213.001                                                                                                     |
| – coolant temperature sensor                                                        | 2174623/3 or ИЦФР 405213.002                                                                                                     |
| – electric fuel pump                                                                | 2173396/1                                                                                                                        |
| – pump-and-injector units control electromagnet with rack position sensor           | 2205211/2                                                                                                                        |
| – electromagnetic control valve of exhaust gases recirculation system               | 1902.3741                                                                                                                        |
| – glow plug relay                                                                   | 0332.002156 Bosch                                                                                                                |
| – engine electronic control system and electric fuel pump cutting-in relay (2 pcs.) | 2206107/0 or 94.374.000                                                                                                          |
| Servo drive reducing gear of fuel injection timing control mechanism (GAZ-5602)     | ДПП-28-1-2-12                                                                                                                    |

<sup>1)</sup> – Made by “BOSCH”.

<sup>2)</sup> Made by “SIEMENS”.

|                                                                                          |                                                                  |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Thermostarter control unit (Sofim 8140, 43C)                                             | 500 337969                                                       |
| Electric fuel pump (ZMZ-40522)                                                           | 505.1139                                                         |
| Electric fuel pump relay (ZMZ-40522), engine electronic control system relay (ZMZ-40522) | 113.3747-10, 90.3747-10 or 85.3747                               |
| Submersible electric fuel pump module (ZMZ-40522)                                        | 505.1139 or 9П2960012                                            |
| Ignition coil (ZMZ-4061, ZMZ-4063, ZMZ-40522)                                            | 3012. 3705 or 406.3705 (2 pcs. each)                             |
| Electromagnetic valve ЭПХХ (ZMZ-4061, ZMZ-4063)                                          | 19.3741 or ИЖКЭ-3741                                             |
| Spark plugs (ZMZ-4061, ZMZ-4063, ZMZ-40522)                                              | A 14/ДВР or WR8DC <sup>1)</sup> or LR17YC <sup>2)</sup>          |
| Storage battery:                                                                         | 6CT-66A <sup>3)</sup>                                            |
| — for ZMZ-4061, 4063, 40522 engines                                                      | 6CT-55A                                                          |
| — for GAZ-560, 5601, 5602 engines                                                        | 6CT-74A VARTA                                                    |
| Additional storage battery <sup>3)</sup>                                                 | 50 A-h, non-serviceable with gas absorption, type 95502, "VARTA" |
| Contactors <sup>3)</sup>                                                                 | KT 123 or 12 KD 510                                              |
| Fog lights <sup>3)</sup>                                                                 | ФГ 122 M                                                         |
| Battery switch <sup>3, 4)</sup>                                                          | 13.3737 remote control                                           |
| Head lamps                                                                               |                                                                  |
| — right                                                                                  | 0301215 202 or 1512.3775000                                      |
| — left                                                                                   | 0301215 201 or 1502.3775000                                      |
| Tail lights:                                                                             |                                                                  |
| — for vehicles with cargo body                                                           | 171.3716 or 7702.3716                                            |
| — for vans and buses                                                                     | 70.3716 (right), 701.3716 (left)                                 |
| Windshield wiper                                                                         | 60.5205010 or 70.5205000                                         |
| Horns                                                                                    | 22.3721/221.3721                                                 |

### 3.8. BODY OF VANS AND BUSES

|           |                                                                                                                                                                                                           |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Body      | All-metal, semi-hood, five-door.<br>Two swing doors of the cab, one side sliding door and two rear double-swing doors of passenger compartment or one rear flap door (for "Sobol" vehicles with low roof) |
| — bus cab | Two- or three seat                                                                                                                                                                                        |
| — van cab | Three- or seven-seat                                                                                                                                                                                      |

<sup>1)</sup> Made by "BOSCH".

<sup>2)</sup> Made by "BRISK".

<sup>3)</sup> For GAZ-32214, GAZ-322174 vehicles.

<sup>4)</sup> For buses.

|                                                          |                           |                         |
|----------------------------------------------------------|---------------------------|-------------------------|
| Overall dimensions (inner) of van cargo compartment, mm: | <u>“GAZelle” Vehicles</u> | <u>“Sobol” Vehicles</u> |
| — length                                                 | 3140/2000 <sup>1)</sup>   | 2460/1330 <sup>1)</sup> |
| — width                                                  | 1830                      | 1830                    |
| — height                                                 | 1500                      | 1430/1530 <sup>2)</sup> |
| — van cargo compartment capacity, m <sup>3</sup>         | 9/6 <sup>1)</sup>         | 6,4/3,4 <sup>1)</sup>   |

### 3.9. CAB AND CARGO BODY

|            |                                                |                              |
|------------|------------------------------------------------|------------------------------|
| Cab        | GAZ-3302, GAZ-330202,<br>GAZ-330232, GAZ-33027 | GAZ-33023,<br>GAZ-330273     |
|            | Metal, two-door,<br>three-seat                 | Metal, two-door,<br>six-seat |
| Cargo body | Metal, with tail gate and side flaps           |                              |

### 3.10. MAIN ADJUSTMENT AND CHECKING DATA

*For vehicles with engines ZMZ-4061, ZMZ-4063, ZMZ-40522*

|                                                                           |          |
|---------------------------------------------------------------------------|----------|
| Coolant rated temperature in cooling system, °C                           | 80–105   |
| Minimum engine idle speed, min <sup>-1</sup> :                            |          |
| — engine ZMZ-4061, ZMZ 4063                                               | 700–800  |
| — engine ZMZ-40522                                                        | 800–900  |
| Spark plug gap (ZMZ-4061, 4063, 40522), mm                                | 0.7–0.85 |
| Belt sag between alternator and water pump pulley under 8 daN (8 kgf), mm | 15       |

*For vehicles with engines GAZ-560, 5601, 5602*

|                                                                                                 |             |
|-------------------------------------------------------------------------------------------------|-------------|
| Clearance between rocking levers and cam heels of exhaust valves on cold engine at 15–20° C, mm | 0.3 – 0.34  |
| Clearance between rocking levers and cam heels of intake valves on cold engine at 15–20° C, mm  | 0.15 – 0.19 |
| Rated coolant temperature, °C                                                                   | 85–95       |

<sup>1)</sup> For vans with two rows of seats.

<sup>2)</sup> For “Sobol” vehicles with medium roof.

|                                                                                      |                                                                           |
|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Minimum engine idle speed, min <sup>-1</sup>                                         | 850                                                                       |
| Belt sag <sup>1)</sup> (between alternator and fan pulleys) under 4 da·N (4 kgf), mm | 10                                                                        |
| Camshaft drive toothed belt tension, daN (kgf)                                       | 50±5 (50±5)                                                               |
| Pump-and-injector unit plunger setting travel, mm                                    | 8,04 <sup>+0.05</sup> (GAZ-560, 5601, 5602 engines)                       |
| Pump-and-injector unit plunger travel up to TDC in the first cylinder, mm            | 3,2 <sub>-0.04</sub> (GAZ-560, 5601)<br>3,14 <sub>-0.004</sub> (GAZ-5602) |

*For vehicles with Sofim 8140. 43C engine*

|                                                                                                               |                                     |
|---------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Optimum fluid temperature in cooling system, °C                                                               | 85–95                               |
| Minimum idling speed, min <sup>-1</sup>                                                                       | 800±25                              |
| Clutch pedal free travel, mm                                                                                  | 12–28                               |
| Brake pedal free travel when the engine is not running                                                        | 3–5                                 |
| Total play <sup>2)</sup> of steering wheel in the position corresponding to vehicle straightforward run, deg. | Not more than 25 (20) <sup>3)</sup> |
| Minimum allowable thickness of friction layer, mm:                                                            |                                     |
| — front disk brake shoes                                                                                      | 3.0                                 |
| — rear drum brake linings                                                                                     | 1.0                                 |
| Minimum slope at which parking brake must hold fully loaded vehicle, %                                        | 16                                  |

*“GAZelle” Vehicles*

|                                                     |                                                            |
|-----------------------------------------------------|------------------------------------------------------------|
| Front wheel geometry:                               |                                                            |
| — camber <sup>4)</sup>                              | 0°30' – 1°                                                 |
| — pivot transverse inclination <sup>4)</sup>        | 8°                                                         |
| — caster <sup>4)</sup>                              | 3°28' ± 30' (4°) <sup>5)</sup>                             |
| — toe-in, mm                                        | 0 – 3                                                      |
| Tyre inflation pressure, kPa (kgf/cm <sup>2</sup> ) |                                                            |
| — front wheels                                      | 290 + 10 (3.0 + 0.1)<br>240 + 10 (2.5 + 0.1) <sup>5)</sup> |

<sup>1)</sup> For reference only, non-adjustable.

<sup>2)</sup> Total play of steering wheel for the vehicles with power steering is taken with the engine running.

<sup>3)</sup> For buses.

<sup>4)</sup> The parameter is provided (for vehicle gross mass) by vehicle design and is not to be adjusted.

<sup>5)</sup> For 4x4 types of vehicles.

|               |                                    |
|---------------|------------------------------------|
| – rear wheels | 290 + 10 (3.0 + 0.1)               |
|               | 240 + 10 (2.5 + 0.1) <sup>1)</sup> |
|               | 270 + 10 (2.8 + 0.1) <sup>2)</sup> |

**Note:** air pressure in the tyres of each axle must be the same according to the values indicated.

### *“Sobol” Vehicles*

Front wheels<sup>3)</sup> geometry:

|                                                                                    |                                                                |
|------------------------------------------------------------------------------------|----------------------------------------------------------------|
| – caster                                                                           | +4°30' ± 1° (+3°±1°) <sup>4)</sup>                             |
| – left and right wheels angles<br>difference while adjusting caster,<br>not more   | 0°30'                                                          |
| – camber                                                                           | 0°30'±30' (+1°±30') <sup>4)</sup>                              |
| – left and right wheels angles<br>difference while adjusting cam-<br>ber, not more | 0°30'                                                          |
| – toe-in (of every wheel to ve-<br>hicle longitudinal axis)                        | from +0°03' to +0°10'<br>(from +0°01' to +0°08') <sup>4)</sup> |

Front wheels geometry<sup>1)</sup>

|                                              |     |
|----------------------------------------------|-----|
| – camber <sup>3)</sup>                       | 1°  |
| – pivot transverse inclination <sup>1)</sup> | 8°  |
| – pivot linear inclination <sup>1)</sup>     | 4°  |
| – toe-in, mm                                 | 0–3 |

Tyre inflation pressure<sup>3)</sup>, kPa  
(kgf/cm<sup>2</sup>)

|                |                                                                                                                                                                                                                                                                   |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| – front wheels | 260+10 (2,7+0,1) – for buses<br>320+10 (3,3+0,1) – for GAZ-2310,<br>GAZ-2752 with 185/75 R16C tires<br>250+10 (2,6+0,1) – for GAZ-2310,<br>GAZ-2752 with 215/65 R15 tires                                                                                         |
| – rear wheels  | 270+10 (2,8+0,1) – for buses with six<br>passenger seats<br>300+10 (3,1+0,1) – for buses with ten<br>passenger seats<br>380+10 (3,9+0,1) – for GAZ-2310,<br>GAZ-2752 with 185/75 R16C tires<br>290+10 (3,0+0,1) – for GAZ-2310,<br>GAZ-2752 with 215/65 R15 tires |

<sup>1)</sup> For 4x4 types of vehicles.

<sup>2)</sup> For buses GAZ-3221, GAZ-32213.

<sup>3)</sup> For vehicles type 4x2.

<sup>4)</sup> Angle values for vehicles of kerb mass are given in brackets, angle values for vehicles of gross mass are given without brackets.

<sup>5)</sup> The parameter is provided (for vehicles of gross mass) by the vehicle design and is not to be adjusted.

Tyre inflation pressure<sup>1)</sup>, kPa  
(kgf/cm<sup>2</sup>)

|                |                      |
|----------------|----------------------|
| — front wheels | 250 + 10 (2.5 + 0.1) |
| — rear wheels  | 250 + 10 (2.5 + 0.1) |

**Note:** tyre inflation pressure of each axle must be the same, according to the values indicated.

---

<sup>1)</sup> For vehicles type 4×4.

4. CONTROLS AND INSTRUMENTS

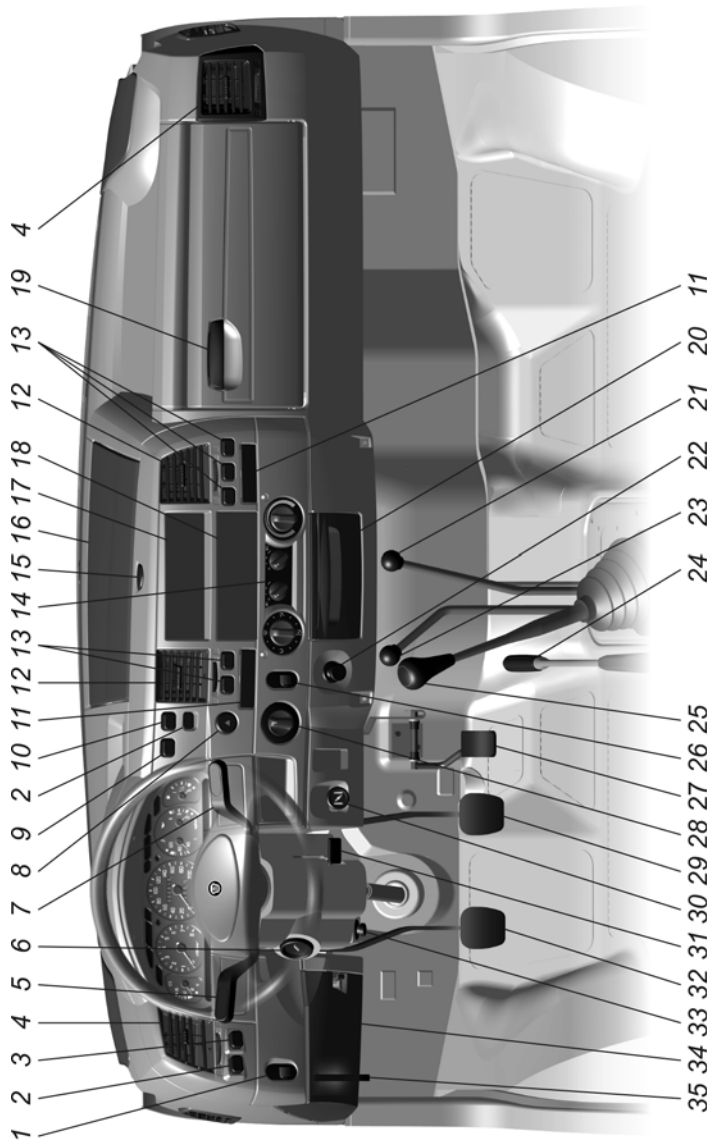


Fig. 4.1. Controls

**Positions of controls<sup>1)</sup> are given in fig. 4.1**

**1. Headlight aiming device control knob** depending on vehicle loading (see subsection 8.7).

**2, 11, 13 and 18. Reserve.**

**3. Warning lamps condition check-up switch.**

**4. Side ventilation grids.**

**5. Turn indicator, dimmer and horn<sup>2)</sup> switch lever.** The switch lever has six fixed positions (from I to VI) and four non-fixed positions “A” (fig. 4.2 and 4.3).

If the lever is in position I and master light switch knob – in position II, the lower beam is on. When the lever is moved to position II upper beam is switched on and blue indicator lights up.

Pulling the lever repeatedly from position I along the steering column (non-fixed position) switches on headlamp upper beam for a short time. Depressing the switch lever button (in any position of the lever) turns on the horn<sup>2)</sup> (non-fixed position) – see fig. 4.2.

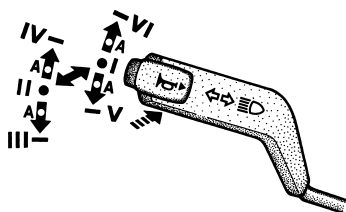


Fig. 4.2. Turn indicator, dimmer and horn switch lever

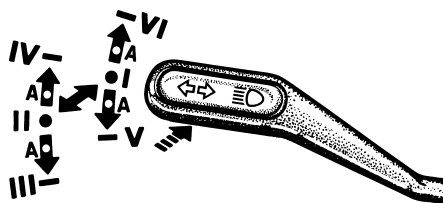


Fig. 4.3. Turn indicator and dimmer switch lever

To operate turn indicators move the lever from positions I or II up to positions VI or IV (right turn) or down to positions V or III (left turn). A green warning light comes on flashing on the instrument cluster. After the turn is completed the switch lever automatically returns to position I or II. To switch on turn indicator momentarily shift the switch lever to suitable “A” non-fixed position. When released the lever returns to position I or II.

**6. Ignition (engine control)<sup>3)</sup>, starter and anti-theft device switch.**

The key positions are given in fig. 4.4.

<sup>1)</sup> On some of the vehicles transfer case (4WD vehicles) gears are shifted by one lever instead of two (pos. 21 and 23).

<sup>2)</sup> On some of the vehicles the horn is switched on by means of windshield wiper and washer control lever (see Fig. 4.6).

<sup>3)</sup> For vehicles with engines GAZ-560, GAZ-5601, 5602, Sofim 8140. 43C.

- 0 – all Off, the key cannot be pulled out, anti-theft device is not engaged;
- I – ignition (instrument cluster and engine electronic control system)<sup>1)</sup> are On; the key cannot be pulled out;
- II – ignition (instrument cluster and engine control system)<sup>1)</sup> and starter are On; the key cannot be pulled out;
- III – ignition (instrument cluster)<sup>1)</sup> is Off; when the key is withdrawn, the anti-theft device is engaged.

To release the anti-theft device fit the key, then gently swinging the steering wheel to both sides turn the key to position 0.

The engine is shut down by turning the key to position 0.

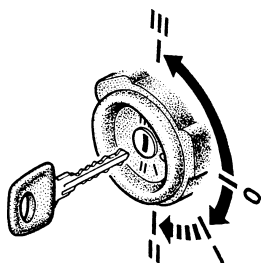


Fig. 4.4. Ignition (engine control)<sup>1)</sup>, starter and anti-theft device switch

## 7. Windshield wiper, washer and horn<sup>2)</sup> switch lever.

The positions of the lever (fig. 4.5 and 4.6):

- 0 – windshield wiper is OFF;
- I – low speed of windshield wiper;
- II – high speed of windshield wiper;
- III – intermittent operation of windshield wiper.

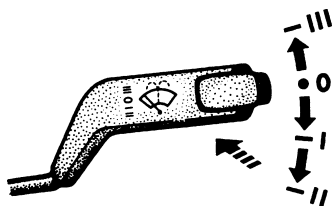


Fig. 4.5. Windshield wiper and washer lever positions

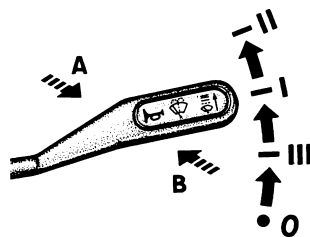


Fig. 4.6. Windshield wiper, washer and horn lever position

<sup>1)</sup> For vehicles with engines GAZ-560, GAZ-5601, 5602, Sofim 8140. 43C.

<sup>2)</sup> On some of the vehicles the horn is turned on by turn indicator and headlamp switch control lever (see Fig. 4.2).

In case the control lever is not equipped with horn switch (fig. 4.5), to turn on windshield wiper and washer momentarily pull the lever (in the direction of the arrow) from position 0.

In case the control lever is equipped with horn switch (fig. 4.6), to turn on windshield wiper and washer momentarily push the lever from position 0 in the direction of arrow "A" and to turn on the horn pull the lever (from any position) in the direction of arrow "B".

Windshield washer can be also switched on from all lever positions. Windshield wiper operates only when ignition is switched on.

#### **8. Emergency flasher warning system button switch.**

When in switched-on position all turn indicator bulbs and red bulb inside the button switch (fig. 4.7) are flashing simultaneously.



Fig. 4.7. Emergency flasher warning system button switch

Emergency flasher warning system should be switched on in case of vehicle accidental stop in order to inform other drivers and maintenance services about accidents on the road.

#### **9. Left row dome lamps switch of passenger compartment (buses).**

**Spot light switch (above rear door)** – for GAZ-32214, GAZ-322174.

#### **10. Right row dome lamps switch of passenger compartment (buses).**

– **Rear row seats dome lamp switch of the cab** (for vehicles with two rows of seats).

– **Side spot light switch (right)** – for GAZ-32214, GAZ-322174.

#### **12. Central ventilation grids.**

#### **14. Heating and ventilation control panel.**

#### **15. Lock button for documents box cover.**

#### **16. Documents compartment cover.**

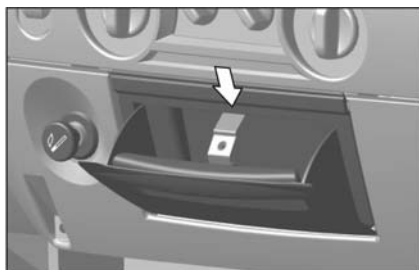
#### **17. Space for radio set/cassette player**

– **Signaling and loudspeaker system or audible-signaling device control panel** (for GAZ-32214, GAZ-322174).

#### **19. Glove box lock handle.**

**20. Ashtray.** Removal of ashtray is shown in fig. 4.8. To empty the ashtray pull it, push spring catcher upwards and remove the ashtray from its slot. Fit the ashtray back lifting-up the spring catcher.

Fig. 4.8. Ashtray



**21. Transfer case gearshift lever** (for 4×4 type of vehicles with two transfer case gearshift levers). Changeover layout for gearbox and transfer case gearshifting and differential lock engagement is given in fig. 4.10.

– gearshift and differential lock engagement lever of transfer case (for 4×4 type of vehicles with one transfer case lever). Changeover layout is given in fig. 4.10.

**22. Cigarette lighter.** To use the lighter push it and release. The lighter kick-out with a click means that the coil is hot. Do not reuse the lighter sooner than in 30 s.

When the lighter is removed it is allowed to use its socket for inspection lamp plug connection.

**23. Transfer case differential lock engagement lever** (for 4×4 type of vehicles with two transfer case gearshift levers). See changeover layout in fig. 4.10.

**24. Parking brake lever.** For braking the vehicle pull the brake control lever up. If ignition is on warning lamp 9 (fig. 4.14) is flashing on the instrument cluster. For releasing the brake depress the grip knob. With the brake released the brake light goes out.

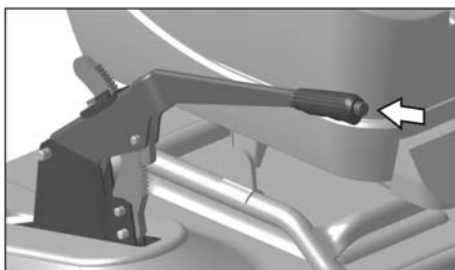


Fig. 4.9. Parking brake lever

**25. Gearbox lever.** The gearbox is equipped with safety device which prevents accidental engagement of reverse gear during disengagement of the fifth gear. Engage reverse gear only after full stop of the vehicle. When reverse gear is engaged the backing light goes on in the tail lamps.

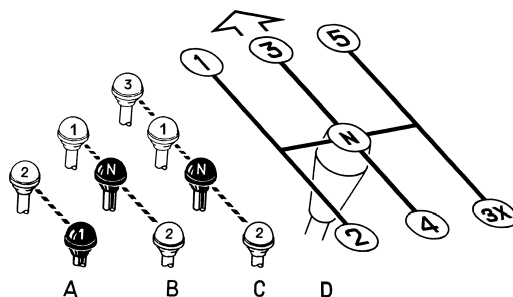


Fig.4.10. Changeover layout:

A – transfer case differential lock engagement<sup>1)</sup> (1 – disengaged, 2 – engaged );  
 B – transfer case<sup>1)</sup>gears (1 – underdrive, 2–high gear); C<sup>2)</sup> – transfer case gears and differential lock engagement (1 – underdrive, 2 – high gear, 3 – underdrive and differential lock are engaged); D – gearbox

## 26. Instrument lighting control knob.

## 27. Accelerator pedal.

**28. Master light switch.** The switch has five fixed positions (fig. 4.11):  
 0 – all external lighting is OFF.

I – clearance lights, instrument cluster lighting, rear license plate lamp and some electrical equipment controls lighting is ON.

II – additionally ON is upper or lower beam depending on the position of turn indicator and dimmer switch lever (position I or II correspondingly).

III – additionally (position I or II) front fog<sup>3)</sup> lamps are ON.

IV – additionally (position III) rear fog light is ON.

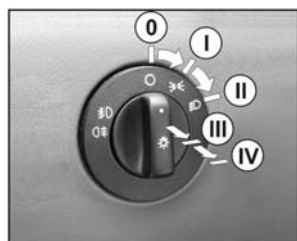


Fig. 4.11. Positions of master light switch handle

<sup>1)</sup> For 4x4 type of vehicles.

<sup>2)</sup> For 4x4 type of vehicles with one transfer case gearshift lever.

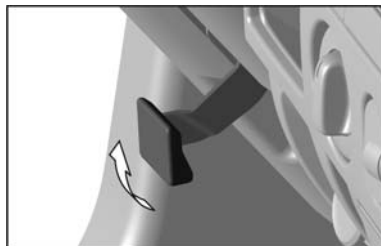
<sup>3)</sup> Mounted on some of the vehicles.

**29. Service brake pedal.**

**30. Choke control knob** (for vehicles with engines ZMZ-4061, ZMZ-4063).

**31. Steering column adjustment control lever.** (fig. 4.12). Pulling the lever and moving it upwards (within the limits of 80°) results in releasing of the steering column. After that the steering wheel can be set in the handy position for a driver and locked in this position by setting the lever to the initial position.

**Fig. 4.12.** Steering column adjustment control lever



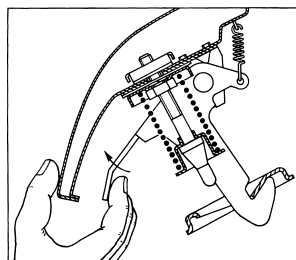
**32. Clutch pedal.**

**33. Storage battery remote button switch (for buses).**

**34. Fuse block.**

**35. Bonnet release lever.** To open the hood pull lock handle to release the catch of the lock and open the hood slightly, then push the handle back home. To open the hood completely, move aside the latch mounted on the lower front edge of the hood (fig. 4.13).

**Fig. 4.13. Hood latch release**



Positions of instruments on vehicles with ZMZ, GAZ-560, 5601, 5602 engines are given in fig. 4.14.

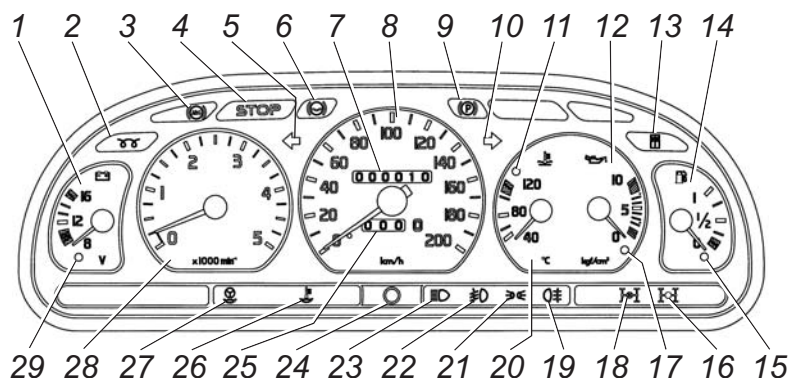


Fig. 4.14. Instrument cluster

### 1. Voltmeter

**2. Warning lamp (orange) of engine electronic control system (ZMZ-40522, ZMZ-4061, ZMZ-4063).** When the control system is in good condition the warning lamp lights up when ignition is on, glows during 5–10 s, then goes out. It means that engine electronic control system is ready for engine start-up. Lighting up or flashing of the lamp during vehicle movement informs about a failure of some elements of the engine control system;

– **warning lamp (orange) of glow plugs cutting-in** (used also as a warning lamp when checking-up of engine electronic control system) – for vehicles with engines GAZ-560, GAZ-5601, 5602.

**3. Warning lamp (red) of anti-lock brake system (ABS)** – mounted on the buses.

**4. Warning lamp (red) “STOP”.**

**5. Warning lamp (green) of left turn indicators.**

**6. Warning lamp (red) of brake fluid low level.**

Lights up when brake fluid level in the master cylinder becomes lower than allowed.

**7. Total distance counter.**

**8. Speedometer.**

**9. Warning lamp (red) of parking brake engagement.**

Starts flashing after turning on the ignition key, if the parking brake is engaged.

**10. Warning lamp (green) of right turn indicators.**

**11. Warning lamp (red) of engine overheating.**

If the lamp lights up shut down the engine and eliminate the reason of overheating.

**12. Oil pressure gauge.**

**13. Warning lamp (reserve).**

**14. Fuel gauge.**

**15. Warning lamp (orange) of low fuel level in the tank.** Lights up when less than 10 l of fuel remains in the tank.

**16. Warning lamp (green) of transfer case low gear engagement** (for 4x4 type of vehicles).

**17. Warning lamp (orange) of central differential lock engagement** (for 4x4 type of vehicles).

**18. Warning lamp (red) of oil pressure drop.** Lights up when the ignition key is turned on. The lamp may glow with the engine running at idle speed and at sharp braking. The lamp should go out when the engine speed is increased above idle level. Should the lamp light up under normal conditions, shut down the engine immediately and check oil level in the crankcase.

**19. Warning lamp (orange).** Lights up when rear fog light is on.

**20. Coolant temperature gauge.**

**21. Warning lamp (green).** Lights up when clearance light is on.

**22. Warning lamp (green).** Lights up when front fog lamps are switched on. (for GAZ-32214, GAZ-322174).

**23. Warning lamp (blue).** Lights up when upper beam is on.

**24. Trip distance counter reset button.**

**25. Trip distance counter.**

**26. Warning lamp (orange) of cooling liquid low level** (GAZ-560, 5601, 5602).

**27. Warning lamp (reserve).**

**28. Tachometer.**

**29. Warning lamp (red) of storage battery discharge.**

*Positions of instruments on the vehicles with Sofim 8140.43C engine are given in Fig. 4.15.*

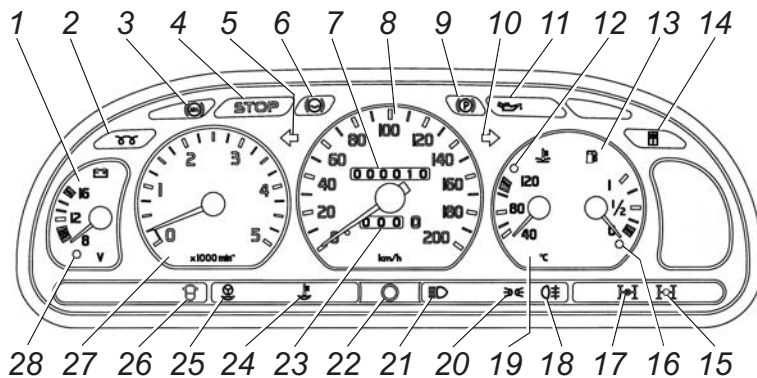


Fig. 4.15. Instrument cluster

**1. Voltmeter.**

**2. Warning lamp of glow plug cutting-in.**

If the warning lamp lights up after turning on of the engine control switch and then goes out, it means that the engine is ready to be started up. When the thermostarter is defective the warning lamp does not light.

**3. Warning lamp (orange) of anti-lock brake system (ABS) (for buses).**

**4. Warning lamp (red) "STOP".**

**5. Warning lamp (green) of left turn indicators.**

**6. Warning lamp (red) of brake fluid low level.**

Lights up when brake fluid level in the master cylinder becomes lower than allowed.

**7. Total distance counter.**

**8. Speedometer.**

**9. Warning lamp (red) of parking brake engagement.**

Starts flashing after turning on of the engine control switch if the parking brake is engaged.

**10. Warning lamp (green) of right turn indicators.**

**11. Warning lamp (red) of oil pressure drop.** Lights up when the engine control switch is turned on. The lamp may glow with the engine running at idle speed and at sharp braking. The lamp should go out when the engine speed

is increased above idle level. Should the lamp light up under normal conditions, shut down the engine immediately and check oil level in the crankcase.

**12. Warning lamp (red) of engine overheating.**

If the lamp lights up shut down the engine and eliminate the reason of overheating.

**13. Fuel gauge.**

**14, 24 and 25. Warning lamps (reserve).**

**15. Warning lamp (green) of transfer case low gear engagement** (for 4×4 vehicles with one transfer case control lever).

**16. Warning lamp (orange) of low fuel level in the tank.** Lights up when less than 10 l of fuel remains in the tank.

**17. Warning lamp (orange) of central differential lock engagement** (for 4×4 vehicles).

**18. Warning lamp (orange) of rear fog light turning-on.**

**19. Coolant temperature gauge.**

**20. Warning lamp (green) of clearance light.**

**21. Warning lamp (blue) of upper beam.**

**22. Trip distance counter reset button.**

**23. Trip distance counter.**

**26. Warning lamp (orange) of water presence in fuel filter.**

**27. Tachometer.**

**28. Warning lamp (red) of storage battery discharge.**

## 5. DOORS, SEATS AND SEAT BELTS

**Doors.** To open the door from outside, pull handle 2 (Fig. 5.1). The doors are equipped with locks that can be locked from outside with key inserted in lock release 3.

From inside the door is locked by pushing down button 1.

To open the door from inside, pull handle 4 with lock button 1 pulled up only.

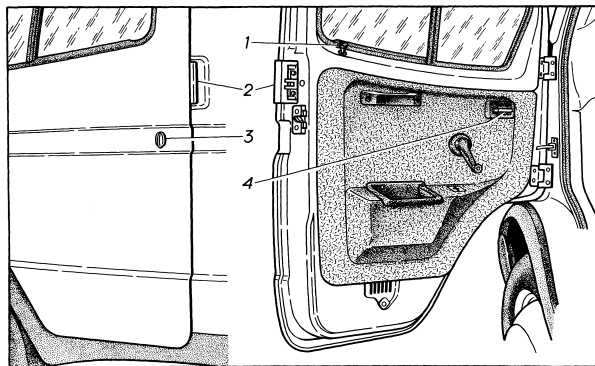


Fig. 5.1. Cab Doors

1 – button; 2 – handle; 3 – lock release; 4 – handle

Van and bus body is provided with two cab doors, side door on the right and two rear doors.

Side door is sliding. To open it from the outside pull by the rear handle and with the help of the front handle slide the door. When opening the door from inside, pull the front handle, then push the rear part of the door and with the help of the handle located on the front part of the window opening pillar, slide the door. Use the same handle to close the door from inside.

Rear doors are opened through 180° and fixed when being opened at 90° and 180°.

Side door and rear right door locks usage is similar to this of cab door locks.

To open the rear left door pull the handle located on the face plane of the door and then pull the door open. To close the door, slam it.

**Never drive the vehicle** with opened or partially closed doors.

**Seats.** The cabin is equipped with two seats. One seat is for a driver, and another one (two-seater)<sup>1)</sup> is for passengers.

<sup>1)</sup> On GAZ-33023 and GAZ-330273 and on some buses with 8(9) seats, the cab is provided with single passenger seat.

For seating convenience the driver seat is adjustable. By turning handle 2 (Fig. 5.2) the seat can be moved in lengthwise direction. Required seat backrest tilt is adjusted by rotation handwheel 3.

For driver's convenience seat tilt is also adjusted by means of nuts 1.

On GAZ-33023 and GAZ-330273 and on some of GAZ-2752 vehicles, second row of seats is installed – two double-seats for four passengers.



Fig. 5.2. Driver Seat

1 – adjusting nuts; 2 – locking handle;  
3 – backrest tilt handwheel

**Seat belts** are effective equipment to protect the driver and any passengers from severe injury in road accidents.

**To fasten the belt (Fig.5.3) it is necessary** to pull the belt webbing slowly by the tongue over the shoulder and across the chest and push it into the buckle nearest the wearer; a click will indicate that the belt is locked.

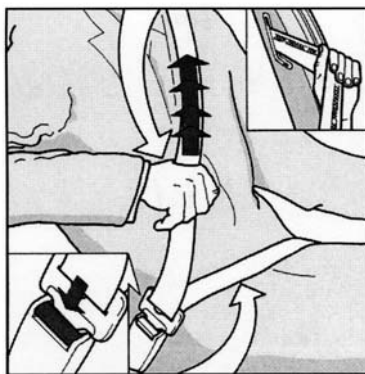


Fig. 5.3. Fastening by Seat Belt

Upper portion of the belt should pass across the centre of the shoulder so that it is not resting on your neck or under the arm.

Lap portion of the belt should be positioned as low on the hips as possible. Otherwise release the belt and adjust its length.

**To release the belt**, press the red panel on the buckle. The belt will automatically retract to its stowed position.

Pregnant women should also wear the seat belt. But she should position the lap part of the belt low so that it does not come across the abdomen.

### ***Warning!***

*The belts which underwent critical loading in a road accident or they became frayed, cut and had other damages must be renewed by new ones in assembly.*

*Never make any changes in the seat belt design.*

*Never attempt to use the seat belt for more than one person.*

*Keep hard or fragile objects such as glasses, fountain pens away from the belt as they may inflict additional injuries.*

*The belt should not be squeezed or twisted. Keep sharp edges of the objects in vehicle passenger compartment away from the belt.*

*If dirty, clean the belt with mild soap and lukewarm water only. Never iron the belt webbing.*

## 6. GAZ-560, 5601, 5602 ENGINE SPECIAL FEATURES

**The monoblock of the engine** is a single-piece structure of the cylinder block and the head of the cylinders.

**The pump-and-injector units** have mechanical drive and electronic control. Fuel-feed control is effected by microprocessor depending on engine speed, accelerator pedal position and signals of sensors mounted on the engine.

**The engine control system** provides variation of engine power performance depending on a driving condition as well as constant engine diagnostics. If its systems fail, the fuel supply decreases or cuts off. Engine control diagram is shown in Fig. 6.1.

When engine is running accelerator pedal position sensor and engine condition sensors signals are transmitted into control unit. The information is analyzed in the control unit and electromagnet operating the pump-and-injector unit racks receives the control signal.

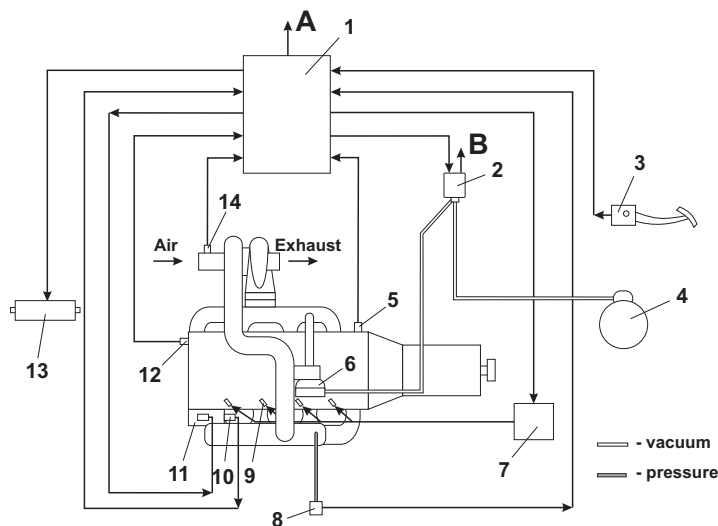


Fig. 6.1. GAZ-560 Engine Control Diagram

A – to diagnostic connector; B – to engine control system relay; 1 – electronic control unit; 2 – EGR system electromagnetic valve; 3 – accelerator pedal position sensor; 4 – vacuum pump; 5 – engine speed sensor; 6 – EGR system actuating valve; 7 – glow plugs relay; 8 – supercharging air pressure sensor; 9 – glow plugs; 10 – rack position sensor; 11 – pump-and-injector units control electromagnet; 12 – coolant temperature sensor; 13 – fuel priming pump; 14 – air temperature sensor

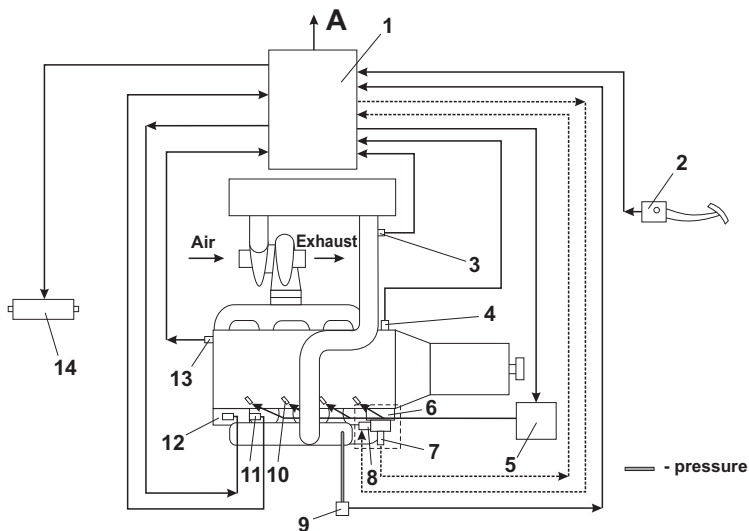


Fig. 6.2 GAZ-5601, 5602 Engine Control Diagram

A – to diagnostic connector; 1 – electronic control unit; 2 – accelerator pedal position sensor; 3 – air temperature sensor; 4 – engine speed sensor; 5 – glow plugs relay; 6 – fuel injection advance angle control servo mechanism; 7 – servo mechanism position sensor; 8 – servo mechanism gear unit; 9 – supercharging air pressure sensor; 10 – glow plugs; 11 – rack position sensor; 12 – rack position sensor; 13 – coolant temperature sensor; 14 – fuel priming pump

On GAZ-5602 engine the actuating signals are additionally received by fuel injection advance angle control servo mechanism.

For engine diagnostics the computer may be connected to the control unit and the engine run is analyzed according to the special program.

## **7. GAZ-32214 AND GAZ-322174 SPECIAL FEATURES**

### **STORAGE BATTERIES**

Additional battery 50 a-h, service-free, with gas absorption, type 95502 “VARTA” is installed in vehicle’s compartment to connect medical equipment.

To avoid the voltage drop across the medical equipment the additional battery is cut off automatically from vehicle’s electrical equipment by means of contactor KT128 or 12KД510 at the moment of engine starting.

### **LIGHTING DEVICES**

Directional lighting headlamps are installed on the roof above side and rear doors of the compartment. Headlamps are designed to illuminate the areas of embussing and loading of sick people; they are turned on by means of button switches located on the instrument panel.

Compartment lighting is provided by means of luminescent dome lights fitted on the compartment ceiling.

Monitor dome light with directional effect section is installed on entresol in the left front part of the compartment.

Compartment dome light and stretches lamp are turned on by switches located on the instrument panel and medical equipment control panel. Monitor dome light switch is installed on its housing.

### **ELECTRIC POWER SUPPLY SYSTEM**

The vehicle is equipped with power supply system CЭC 97 designed to feed  $220 \pm 22$  V,  $50 \pm 0.5$  Hz voltage in medical compartment and for charging storage batteries in automatic mode when the vehicle is at parking place.

Board lead-in to connect to outer current source is located on the outside of the vehicle in the rear part of the body wall. Socket of junction cable is connected to board lead-in, and plug with safety cut-off device on the other end of the cable is connected to two-pole socket (with side ground contacts) of 220 V, 50 Hz stationary electric circuit.

Power supply system device with control members 220 V twin bipolar socket is installed in medical compartment in front lower section of rear rack (see Fig. 7.1).

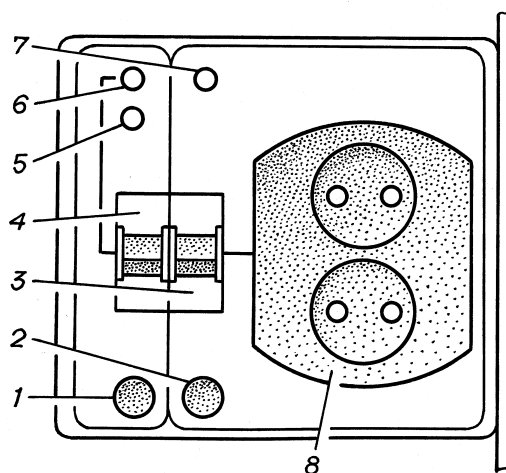


Fig. 7.1. **Power Supply System Device Front Panel**

1 – 2A fuse; 2 – 10A fuse; 3 – “220V” automatic switch; 4 – charging unit “Charger” automatic switch; 5 – “Charge” indicator; 6 – “On” indicator; 7 – “Power” indicator; 8 – twin two-pole socket (220V, 50Hz) with side ground contacts

## SEQUENCE OF OPERATIONS

To provide storage batteries automatic charging and 220V (50Hz) power supply of consumers it is necessary:

1. To open red colour protective cover of board lead-in located on left wall of the vehicle body and connect the socket of outer connection cable to the board lead-in.

2. To connect the plug with built-in safety cut-off device to two-pole socket (with side ground contacts) of 220V (50Hz) stationary electric circuit.

**Attention!** Be sure to follow connection sequence according to items 1 and 2.

Carry out disconnection in the reverse order.

3. To check operation of safety cut-off device, for this purpose make use of controls and signaling located on safety cut-off device housing:

- push «Test» button, «Off» indicator should light up therewith;
- push «Return» button, «Off» indicator should go out therewith. If it does not happen pull out the plug with safety cut-off device from the socket and insert it again in 3–5 sec. If even in this case the indicator does not go out further operation of the system is prohibited. It is necessary to detect and eliminate the trouble.

4. To set automatic switch 4 (“Charger”) in upper position, in doing so indicator 6 (“On”) and 5 (“Charge”) showing the beginning of storage batteries charging condition should light up.

5. To connect 220V (50Hz) power consumers to socket 8 and set switch 3 «220V» in upper position.

The system is ready to operate.

**Attention!** Input power at socket 8 should not exceed 1.4 kW.

6. On completing of operation set automatic switch 4 and 3 in lower position and disconnect the outer cable from stationary electric circuit.

### **Safety Precautions:**

1. It is prohibited to use:

- connecting wires and the cable of outer connection with damaged insulation;

- home-made connecting wires.

2. When connecting electric power supply system to 220V (50Hz) stationary electric circuit and automatic switches 4 and 3 are turned on it is prohibited to:

- connect the storage batteries or disconnect them from the safety cut-off device;

- change the fuses.

3. The outer connection cable plug with built-in safety cut-off device should be connected to two-pole socket with side ground contacts of 220V (50Hz) stationary electric circuit. Be sure to connect the side ground contacts of two-pole socket to ground bar.

## **SIGNALING AND LOUDSPEAKER SYSTEM**

Signaling and loudspeaker system CTC-100 is installed on the vehicle.

It consists of light-acoustic unit installed on vehicle’s roof and control desk with microphone.

CTC-100 provides:

- repeating of vocal information when operating with microphone, tape recorder or radio set;

- translation of electronic siren signals of three types;

- limited output power mode when any siren is working from microphone, tape recorder or radio set

CTC-100 signaling and loudspeaker system control is shown in Fig. 7.2.

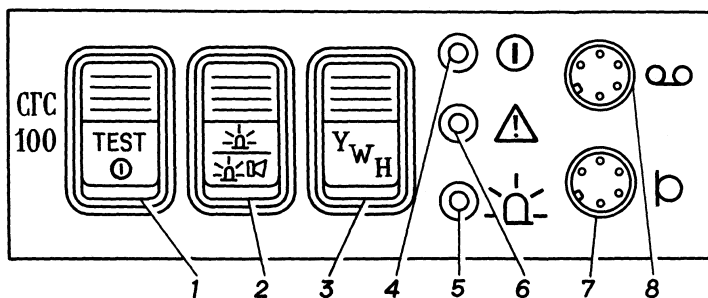


Fig. 7.2. Signaling and Loudspeaker System Control Desk

1 – power “ON” and “TEST” mode key; 2 – beacons and siren “ON” key; 3 – siren signal “ON” key; 4 – power “ON” warning lamp; 5 – flashing beacon “ON” warning lamp; 6 – overload warning lamp; 7 – microphone socket; 8 – tape recorder (radio set) socket

Keys 1, 2 and 3 have three positions:

1. Position I (OFF) – top part of the required key (without inscription) is pressed.
2. Position II – middle position.
3. Position III – bottom part of the required key (with inscription) is pressed.

To turn on the system it is necessary to set key 1 to position II. In doing so, green warning lamp 4 lights up; the system operates with limited output power. To operate at maximum power key 1 should be set to position III.

To turn on flashing beacons it is necessary to set key 2 to position II. In doing so, warning lamp 5 should light up.

To turn on siren key 2 should be set to position III and by means of key 3 set the required siren type:

- position I – long siren “W”;
- position II – short siren “Y”;
- position III – short siren “H”.

Siren signal of “Y” type can be also turned on by pushing horn button on steering wheel.

For repeating vocal information microphone should be connected to socket 7. Set key 2 to position I (OFF) and press speaking key on the microphone body. It is possible to repeat information from tape recorder or radio set, for this purpose their line “OUTPUT” should be connected to socket 8.

**Attention!** Lighting up of warning lamp 6 of red colour on signaling and loudspeaker system control desk indicates the system failure. Immediately shift key 1 in position I (OFF) and check the system wiring.

## MEDICAL COMPARTMENT EQUIPMENT

In medical compartment it is located the following:

- personal seats for doctor and attendant;
- folding seat placed along the right side of medical compartment. In folded position additional stretches can be installed on it;
- self-contained heater<sup>1)</sup> mounted inside the folding seat underframe;
- additional storage battery mounted inside the folding seat underframe;
- control panel (see Fig. 7.3.) of medical compartment equipment mounted in the front entresol near splitter plate;
- table-rack with wash-stand and easy detachable tanks for clear and dirty water. It is mounted on the left side of the compartment overhead near splitter plate.

Inside the tank for clear water there is electric pump for water supply into the wash-stand. Electric pump is turned on by means of switch 11. Timely pour clear water and drain dirty one.

- space for ДКИ-Н-04 (on left-hand side wall underneath table-rack cover);
- space for “Пневмокомп-1” apparatus (above table-rack);
- space for АН-8 apparatus (behind the seat located at left-hand side wall);

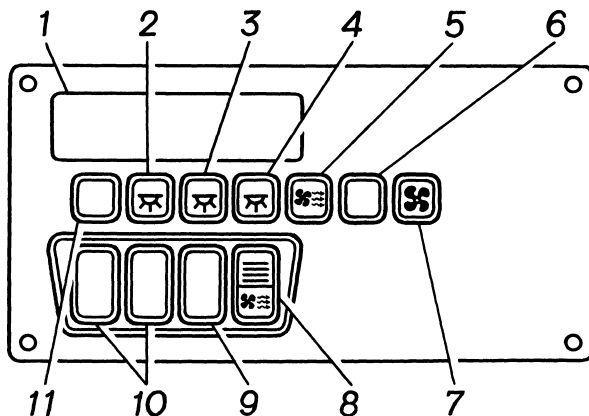


Fig. 7.3. Medical Compartment Equipment Control Panel

1 – fuse set cover; 2 – lamp switch; 3 – compartment left side dome lights switch; 4 – compartment right side dome lights switch; 5 – self-contained heater switch; 6 – self-contained heater operating mode switch; 7 – self-contained heater forced air supply switch; 8 – filter-ventilator unit change-over switch; 9 and 10 – plugs; 11 – wash-stand water supply electric pump switch

<sup>1)</sup> Mounted on some of the vehicle.

- cupboard-rack for medical equipment with niche for oxygen bottles (on the left in the rear part of the compartment);
- receiving device with bogie-stretches (in the middle of the compartment) allowing to shift the stretches block across the compartment and to fix it in traveling position;
- pipe-holder (on compartment ceiling) for medicine dropper and lamp which can be moved along the pipe-holder;
- two sockets to connect medical equipment (on compartment side walls);
- piece of fabric to carry the sick (stored in the recess above the cab).

## 8. NEW VEHICLE RUNNING-IN AND ITS OPERATION

### RUNNING-IN

Durability, efficiency and no-failure operation of the vehicle throughout its life depend to a great extent on how fully and thoroughly you will follow recommendations stated in this section.

No special running-in is required for the vehicle, however during the first 2000 km of run the following rules should be observed:

1. Get under way after warming up the engine at moderate crankshaft speed and at engine steady running (with the choke opened for ZMZ-4061, ZMZ-4063, ZMZ-40522 engines).

2. Start driving off in the first gear only.

3. Avoid driving the vehicle in heavy road conditions (sand, mud, deep snow and so on).

4. Watch the condition of all fastening joints of the vehicle. Loose nuts should be timely tightened up. Particular emphasis should be placed upon securing of pitman arm, steering knuckle arms, tie and drag link joints, spring U-bolts, wheels, silencer intake pipe flange and steering column location mechanism.

5. Check fan and alternator belt tension<sup>1)</sup> because it stretches mostly during the running-in period.

6. Driving speed should not exceed: 20 km/h in first gear, 30 km/h in second gear, 50 km/h in third gear, 70 km/h in fourth gear and 90 km/h in fifth gear.

Conduct maintenance operations opportunely during the running-in period following Service Book instructions.

### 8.1. ENGINE STARTING

#### 8.1.1. Starting and stopping of ZMZ-4061, ZMZ-4063 engines

Prior to engine starting check the levels of coolant in the cooling system and oil in the engine crankcase.

Before starting the engine after the prolonged parking prime the carburetor using the manual fuel pump lever.

**Engine starting from cold** should be carried out as follows:

1. Move the gearshift lever into the neutral position.

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<sup>1)</sup> Engine accessories driving belt tension is performed automatically on the vehicles with GAZ-560, GAZ-5601, 5602 engines.

2. Step on the accelerator pedal and pull out the carburetor choke knob as far as it will go. Release the accelerator pedal. If you do not stick to the above sequence, the choke rod can be broken.

3. Depress the clutch pedal all the way down.

4. Turn on the starter for not more than 10 seconds.

5. As soon as the engine starts, release the key and the clutch pedal. As the engine warms up push in the choke knob gradually into the initial position.

Should the engine fail to fire after the first attempt, allow 1 minute before the second attempt. The second attempt will be possible after turning off and repeated turning on of the ignition only. After two/three unsuccessful attempts, set the carburetor choke knob into the initial position, depress the accelerator pedal all the way down and crank the engine by the starter for 5–10 seconds. If the engine fails to start, check the fuel and ignition system and eliminate the trouble.

Before starting the engine from cold in winter depress sharply the accelerator pedal (1–2 times) to enrich fuel mixture.

**When starting up a warm or hot engine**, depress the accelerator pedal to  $\frac{1}{3} - \frac{1}{2}$  of its travel. Do not close down the choke as this produces an excessively rich fuel mixture and makes proper starting difficult.

**Engine stopping** is carried out by turning the ignition key into position “0”. If the engine has been operated in heavy duty cycle its instantaneous shut-down is not allowed. Let it run for 2–3 minutes at idle speed.

### 8.1.2. Starting and stopping of ZMZ-40522 engine

Prior to engine starting check the levels of coolant in the cooling system and oil in the engine crankcase.

**Start the engine** in the following sequence:

1. Move the gearshift lever into the neutral position.

2. Depress the clutch pedal all the way down.

3. Turn on the ignition. Warning lamps 2, 18 and 27 (see Fig. 4.14) are to light up. Warning lamp 2 should light for 5–10 seconds and then go out. Its continuous lighting (for more than 15 sec.) indicates that the engine control system is out of order. However in most cases backup control modes make it possible to start the engine and keep on driving up to the service station or garage (system operation in the backup mode does not produce a significant negative effect on the engine but its pick-up becomes worse and the fuel consumption increases in the process).

4. Turn on the starter for not more than 10 seconds. Do not depress the accelerator pedal! Warning lamps 18 and 27 should go out.

5. As soon as the engine starts, release the key and the clutch pedal. As may be required, 2–3 attempts of engine starting are allowed with the interval between them for not less than 1 minute, from “0” position of the ignition switch each time.

On cold engine momentary knock of the hydraulic valve lifters is possible and it will disappear as the engine warms up to the operating temperature.

After engine starting from cold, maintaining of the engine speed and its warming up are carried out automatically as the fuel injection system ensures preparation of fuel mixture corresponding to every temperature condition of the engine.

**Engine stopping** is carried out by turning the ignition key into position “0”. If the engine has been operated in heavy duty cycle its instantaneous shut-down is not allowed. Let it run for 2–3 minutes at idle speed.

### **8.1.3. Starting and stopping of GAZ-560, GAZ-5601, 5602 engines**

Prior to engine starting check coolant level in engine cooling system and oil level in engine crankcase. When starting from cold, glow plugs bolting installed in monoblock cylinders turn on automatically. Glow plugs bolting operating time depends on the engine temperature.

**Engine cold starting** is carried out in the following sequence:

1. Turn on the storage batteries switch.
2. Move the gearshift lever into the neutral position and transfer case (for 4×4 type vehicles) gearshift lever in any gear position.
3. Depress the clutch pedal all the way down.
4. Turn engine starter key to position I (instrument cluster and engine control system – ON). In doing so the electric fuel-feed pump turns on for 5–6 seconds and simultaneously red warning lamp in the oil pressure gauge and warning lamp 2 (Fig. 4.14) of turning on glow plugs bolting will illuminate.
5. When warning lamp goes out, it means that the glow plugs are warmed up, not less than 3 seconds switch on the starter (for not more than 15 seconds) turning the key to non-fixed position II (instrument cluster and starter are switched on).
6. Once the engine starts release the key, which will automatically return to position I. Red warning lamp in the oil pressure gauge goes out.
7. Release the clutch pedal.

Should the engine fail to start it is necessary to make another attempt repeating the above procedures. Allow not less than 1 minute before the second attempt. After the third unsuccessful attempt, find and eliminate the trouble.

After the engine starting and pressure appearing in engine oil system red warning lamp goes out and you may start driving the vehicle.

Start the engine from cold with 15W-40 oil at the ambient air temperature not lower than  $-15^{\circ}\text{C}$ , with 10W-40 oil – not lower than  $-20^{\circ}\text{C}$ , with 5W-40 and 5W-50 oils – not lower than  $-25^{\circ}\text{C}$ .

Engine starting at lower temperatures should be performed after warming it up by starting preheater only (mounted on some vehicle versions).

**Start warm and hot engine** in the following sequence:

1. Turn on the storage batteries switch (for buses).
2. Move the gearshift lever into the neutral position.
3. Start the engine by switching on the starter (without delaying the key in position I).

**Engine stopping.** If the engine has been operated in heavy duty cycle its instantaneous shutdown is not allowed. Let it run for 2–3 minutes at idle speed.

To stop the engine, turn the engine starter key to position 0.

#### 8.1.4. Starting and stopping of Sofim 8140. 43C engine

Engine starting is carried out at the ambient air temperature:

- up to  $+3^{\circ}\text{C}$  without starting assisting devices
- up to  $-25^{\circ}\text{C}$  with thermostarter
- up to  $-45^{\circ}\text{C}$  after engine warming up by means of starting preheater<sup>1)</sup>.

##### 8.1.4.1. Engine starting without start assisting devices.

Before starting the engine after a long parking prime fuel using lever 1 (Fig. 8.1) of manual fuel pump.

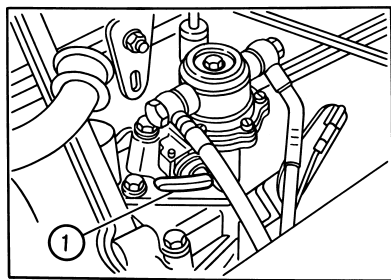


Fig. 8.1. Fuel pump

<sup>1)</sup> Mounted on some of the vehicles.

Then start the engine in the following sequence:

- turn on the storage battery;
- set gearshift lever to neutral;
- turn engine control switch key to fixed position I;
- step on the clutch pedal as far as it will go;
- turn engine control switch to non-fixed position II (i. e. turn on the starter) for not more than 15 seconds;
- once the engine picks up release the key and the clutch pedal.

Should the engine fail to fire, allow 1 minute before the second attempt. After three unsuccessful attempts check the fuel system and eliminate the trouble.

**Engine stopping.** If the engine has been operated at heavy duty cycle its instantaneous shutdown is not allowed. Let it run for 2–3 minutes at idle speed.

To stop the engine turn the engine control switch key to position 0.

#### 8.1.4.2. Engine starting by means of thermostarter

To start the engine by means of thermostarter one should:

- prime the fuel system using manual fuel feed pump;
- set gearshift lever to neutral;
- turn on the storage battery;
- turn engine control switch key to fixed position I;

In so doing, if the temperature under hood is below plus  $(3\pm 1)^{\circ}\text{C}$  the control unit automatically turns on glow plug preheating and the warning lamp lights up. After 20–25 seconds glow plug preheating terminates and the warning lamp goes out.

If the temperature under hood is above plus  $(3\pm 1)^{\circ}\text{C}$ , the warning lamp lights up for 2 seconds only and the thermostarter remains inoperative.

– when the warning lamp goes out, turn the engine control switch key to non-fixed position II (i. e. turn on the starter) and start the engine. When starting the engine the warning lamp turns on for the second time and remains in such position for about 120 seconds: with this period of time the thermostarter warms up the air entering the engine.

Should the engine fail to fire after the first attempt, allow 1 minute and repeat the above procedure.

#### 8.1.4.3. Engine starting by means of starting preheater

Preheating and engine starting should be carried out in the following sequence:

- turn engine control switch key to position I;

- turn handle 4 (see Fig. 8.2) of main Operating Instructions) of air temperature control in the cab clockwise to the angle of not less than 10°;
- start the preheater by pushing the button (timer left-hand button);
- warm up the engine depending on the ambient air temperature for the following period of time:
  - 10–15 min. at the temperature of minus 10–20° C;
  - 20–25 min. at the temperature of minus 30° C;
  - 40–45 min. at the temperature of minus 45° C;
- start the engine similarly to engine starting without engine start assisting devices;
- smoothly engage the clutch pedal (disengaging for several times, if required);
- turn off the preheater pushing the button;
- warm up the engine at idle speed or under load (when driving in the first and the second gears) with medium engine speed, providing that the engine takes up load (capable of speed varying when changing of fuel supply).

**Note:** To increase the engine warming up efficiency it is necessary to fasten the heating cover to the radiator shell.

## **8.2. FUEL-AIR MIXTURE PREHEATING (ZMZ-4061, 4063, 40522 ENGINES)**

Fuel-air mixture preheating is carried out by the coolant of the engine cooling system in the intake manifold.

At the ambient air temperature below 5°C the hose of the air filter should be shifted on the connection pipe (on the engine exhaust manifold).

## **8.3. OIL COOLER COCK (on some of ZMZ-4061, 4063 engines)**

The cock is located on the right side of the middle part of the cylinder block under the intake pipe.

At air temperature above +5°C set the cock handle along the hose to bring the oil cooler into operation.

At air temperature below +5°C set the cock handle at right angle to the hose to shut off the oil cooler.

## **8.4. VEHICLE DRIVING**

It is recommended to start vehicle driving with the engine warmed up. If there is no such possibility and the engine is warming up on the moving vehicle it is advisable at low temperature of ambient air and after prolonged park-

ing to drive some time at low gears and low engine speed. As oil warms up it is necessary to shift to higher gears in succession.

After wading, driving through heavy rain or after washing the vehicle braking surfaces become coated with moisture. This will affect braking efficiency until disks, drums and brake linings are dried by intermittent light application of the brakes.

Drive the vehicle where possible without sharp acceleration and deceleration for this will lead to the increasing tires wear and higher fuel consumption.

**4WD vehicles** are equipped with two-step transfer case with equalizing interaxle controlled slip differential and manual control. Interaxle differential provides constant link of front and rear driving axles, which increases the vehicle stability. Controlled slip of the differential improves cross-country capacity of the vehicle. High gear is engaged in transfer case when hard road and road with good adhesion driving; and underdrive – to negotiate steep upgrades and when soft ground and off-road driving.

Differential lock should be engaged when negotiating difficult terrain or when there is any risk of losing wheel grip only. When engaging the differential lock warning lamp lights up on the instrument cluster. On reaching the hard road the differential lock should be **disengaged** to avoid the excessive wear of vehicle tires and transmission as well as the increase of fuel consumption.

The differential lock can be engaged both from the high gear and the underdrive of the transfer case.

Gear shifting, differential engagement and disengagement in the transfer case should be done when the vehicle is stationary or moving at the speed of up to 5 km/h.

Difficult engagement and disengagement of differential lock may be caused by insufficient running-in of the new parts.

In case of trouble in the differential lock engagement it is necessary to coast the vehicle in chosen direction acting repeatedly, if required, on differential lock control lever of the transfer case till its full engagement.

In case of trouble in differential lock disengagement it should be done under following conditions:

1. If the vehicle has been moving **forward** it is necessary to coast the vehicle **backwards** pushing the clutch pedal and, if required, acting repeatedly on differential lock control lever till full disengagement of the differential lock;
2. If the vehicle has been moving **backwards** it is necessary to coast it **forward** pushing the clutch pedal and, if required, acting repeatedly on differential lock control lever till full disengagement of the differential lock.

Leave the transfer case gearshift lever in high gear engaged position when storing and long-term parking the vehicle in outdoors, under a shed or non-heated indoors in winter.

### 8.5. VEHICLE BRAKING

Design of the brakes ensures braking efficiency. Nevertheless brake the vehicle smoothly, avoiding abrupt braking and interlocking of brake gears.

Do not turn off the ignition or try to remove the key whilst the vehicle is in motion. If for any reason the engine should stop while the vehicle is in motion, braking will require much more effort.

### 8.6. HEATING AND VENTILATION OF THE CAB (PASSENGER COMPARTMENT)

#### Heating

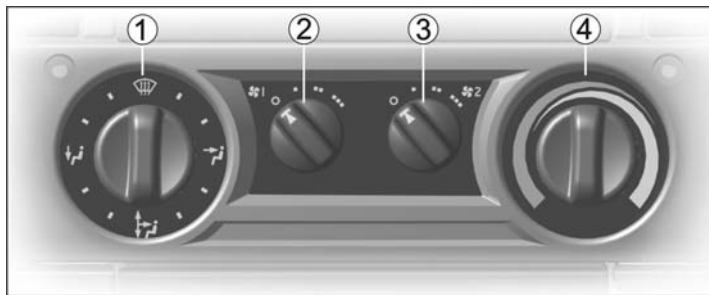


Fig. 8.2. Heating and ventilation control panel

1 – Handle of air distribution control in the cab (passenger compartment):



— air flow is directed to the windscreen and door windows;



— air flow is directed to the chest of the driver and passenger;



— air flow is directed to the windscreen and door windows, to the chest and feet of the driver and passenger;



— air flow is directed only to the feet of the driver and passenger.

2. Control handle of air amount supplied to the cab (passenger compartment). It has four positions:

 – off

 – slow speed of the blower;

 – normal speed of the blower;

 – fast speed of the blower

3. Control handle of warm (heated) air amount supplied to the passenger compartment of vans with two rows of seats and buses. It has four positions:

 – off

 – slow speed of the blower;

 – normal speed of the blower;

 – fast speed of the blower

4. Handle of air temperature control in the cab (passenger compartment). The handle extreme left position (wide part of the blue symbol) activates the ventilation mode. The intermediate and extreme right positions (wide part of the red symbol) activate the heating mode.

### Defrosting and Demisting

To remove quickly frost and condensate from the windscreen and door windows do the following:

- turn handle 1 (Fig. 8.2) of air distribution control to position ;
- turn handle 4 of air temperature control to the extreme right position (wide part of the red symbol);
- turn handle 2 of air amount control to the fast speed of the blower.

#### **To achieve a favourable climate in the cab (passenger compartment):**

- turn handle 1 of air distribution control to the chosen position;
- set the air temperature you prefer (temperature of outside air or hot air from the heater) by turning handle 4 of air temperature control;
- turn handle 2 of air amount control from position  to one of the three positions to get the desirable rate of air flow coming to the passenger compartment.

Central and side ventilation grids on the instrument panel have handles (levers) for shutters control. Shifting of them changes the direction of air flow,

increases or decreases the amount of air coming to the passenger compartment or completely closes the channel of air supply.

To provide comfortable conditions in the passenger compartment of vans with two rows of seats and buses the additional heater is installed which heats the air inside of the cab or passenger compartment. The air flow rate is controlled by handle 3.

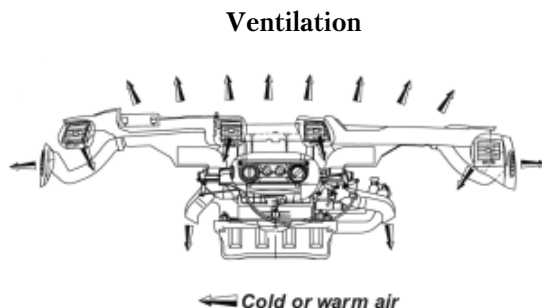


Fig. 8.3. Distribution of Air Flows in the Vehicle Cab

To cut in the ventilation:

- turn handle 4 (fig. 8.2) to the extreme left position (wide part of the blue symbol);
- choose the mode of air distribution by turning handle 1;
- turn handle 2 to get the desirable rate of the air flow coming to the passenger compartment;
- adjust the direction of air flows by turning the shutters of ventilation grids.

To make heating and ventilation effective be sure that the grid of the hole for air intake located on the hood before the windscreen is free from leaves, snow, etc.

Cab and medical compartment heating and ventilation of GAZ-32214 and GAZ-322174 vehicles are similar to those of buses.

Self-contained heater<sup>1)</sup> OH-32Б-12-03 is used as additional heater in medical compartment in GAZ-32214, GAZ-322174 vehicles.

Self-contained heater is air-and-flame type. It operates using fuel from the vehicle's tank. The heater may be used during parking of the vehicle and in movement irrespective of engine running.

<sup>1)</sup> – Mounted on some of the vehicles.

Self-contained heater switches are located on the medical compartment equipment control panel (in the front entresol of the compartment at the top near the bulkhead).

**Note:** Design and operation of self-contained heater, its specifications and maintenance procedure are given in the self-contained heater operating manual attached to the vehicle.

## 8.7. HEADLAMPS

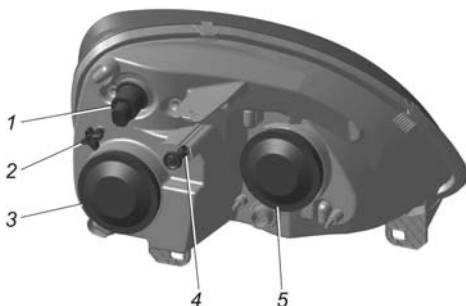
**Caution!** Headlamp, headlamp-block with marking OAO “OCBAP” lenses are made of plastic material. That is why **never** use fuels and other aggressive fluids, as well as dry brushes and wiping waste for cleaning from dust and dirt.

*Remove the dirt from these parts with water jet only.*

**Headlamp-block.** To replace dipped beam and clearance lamp bulbs it is necessary to remove rubber cover 3 (Fig 8.4).

Fig. 8.4. **Headlamp-block**

1 – connector; 2 – light beam horizontal adjustment knob; 3 and 5 – covers; 4 – opening for light beam vertical adjustment



To replace main beam bulb remove rubber cover 5, and unscrew connector 1 to replace turn indicator bulb.

Knob 2 is designed to adjust the direction of light beam in horizontal plane. Vertical adjustment of the light beam is carried out through opening 4 using hexagon spanner or cross-head screwdriver.

Additional vertical adjustment of the dipped beam depending on vehicle loading is performed in passenger compartment by means of handwheel of the headlamp aiming device.

On an unladen vehicle it is necessary to make «0» on the handwheel coincident with «•» mark on the headlamp aiming device housing.

When the vehicle is fully laden, bring:

- «1» on the handwheel (for buses with 8 (9) passenger seats)
- «2» on the handwheel (for vans and buses with 12 (13) passenger seats)
- «3» on the handwheel (for cargo body vehicles)

into coincidence with «•» mark on the headlamp aiming device housing.

Adjust the headlamps in the following sequence:

- check air pressure in tires. Bring it, if necessary, to the required level;
- place the unladen vehicle on a level ground at 5 m distance from the screen (Fig. 8.5);

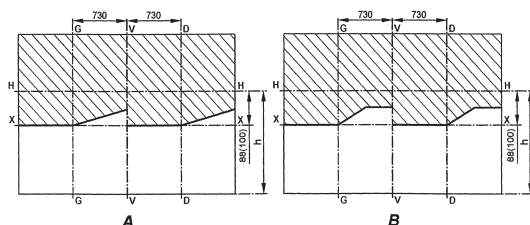


Fig. 8.5. **Screen Layout for Headlamps Adjustment:**

A – headlamps with “AL” marking on the lenses; B – headlamps with “OCBAP” marking on the lenses; h – height of vehicle headlamp dipper beam center; Y – Y – vehicle axis. Dimensions in brackets are for 4WD vehicles.

- bring «0» on the handwheel into coincidence with the mark on the housing of the headlamp aiming device;
- turn on the dipper beam;
- adjust the light beams by knobs 2 (Fig. 8.4) and through opening 4 for each headlamp in turn.

**Caution!** When fitting a halogen bulb in the headlamp, do not touch the bulb glass with the fingers to avoid luminous flux reduction or bulb rapid destruction during its operation.

The horizontal section of light and shade border of adjusted headlamps must coincide with line X–X (Fig. 8.5A, 8.5B), the inclined section of the light and shade border must correspond to Fig. 8.5A (with “AL” marking on the lenses) and Fig. 8.5B (with “OCBAP” marking on the lenses), and the points of horizontal and inclined sections of the line and shade border intersection must coincide with G–G and D–D lines.

## 8.8. FUSES

### Vehicles with ZMZ-4061, 4063, 40522 Engines

Under the hood on the right there is a fuse box БИП-2 where 40A fuse protects illumination circuit of the vehicle and 60A fuse protects general positive circuit of the vehicle except for illumination and starter circuits.

On the left under the instrument panel two fuse boxes БИП-13 are installed on the bracket.

### **Vehicles with GAZ-560, 5601, 5602 Engines**

Under the hood a fuse box Ф5.3722.001 is installed on the storage battery support where 90A fuse protects alternator and glow plug circuit, 40A fuse protects outdoor illumination circuit of the vehicle, 60A fuse protects the circuit of the rest of power consumers except for starter circuit.

The second 60A fuse – reserve.

Under the hood on the cab front panel two 10A fuses (one with green and two red wires, the other – with red and blue wires) and 5A fuse with red and two white wires.

Fuse with blue wire protects the circuit of control unit, engine speed sensor, EGR system electromagnetic valve power supply and the circuit of glow plug bolting control.

Fuse with green wire protects the circuit of electric fuel-feed pump power supply.

Fuse with two white wires protects additionally control unit circuit and “+12V” circuit of diagnostic connector.

On the left two fuse boxes БИП-13 are installed on the instrument panel.

### **Vehicles with Sofim 8140. 43C Engine**

Under the hood on the right there is a fuse box БИП-4.

In БИП-4 fuse box 90 A fuse protects power electric circuit of alternator, thermostarter glow plugs and fuel heater in fuel filter, 40 A fuse protects outdoor illumination circuit, 60 A fuse protects the circuit of the rest of power consumers except for lighting and starter circuits

### **GAZ-32214 and GAZ-322174 Vehicles**

Under the hood fuse box БИП-4 is located on the storage battery support. Upper 90A fuse protects power electric circuit of electrical equipment, the second 40A fuse protects outdoor illumination circuit, the third 60A fuse protects signaling and loudspeaker unit circuit and lower 60A fuse protects the circuit of the rest of power consumers except for the starter circuit.

In medical compartment fuse box БИП-4.02 is installed under the folding seat behind auxiliary storage battery. Two upper 40A and 10A fuses protect power electric circuits of medical compartment electrical equipment.

On the left two fuse boxes БИП-13 are installed under the instrument panel.

## **БПР-13 FUSE BOXES**

### **Upper fuse box fuses protect the circuits of:**

1. 25A – engine control system (ZMZ-40522).
2. 15A – emergency flasher warning lights.
3. 15A – frame switch (for buses), radio and cassette player<sup>1)</sup>.
4. 10A – windscreen wiper, windscreen washer, right row dome lamps<sup>2)</sup> of passenger compartment.
5. 10A – headlamps relay, ABS<sup>2)</sup>, coolant level sensor (GAZ-560, GAZ-5601, 5602).
6. 10A – braking lights.
7. 20A – horn, cigarette lighter, horn relay (GAZ-560, 5601, 5602).
8. 20A – heater electric motor, heating system electric pump (buses and vehicles with two rows of seats, GAZ-32214, GAZ-322174 vehicles).
9. 15A – auxiliary heater electric motor (buses, vans with two rows of seats and GAZ-32214, 322174 vehicles).
10. 10A – instrument cluster, backing light, speed sensor, parking brake warning lamp breaker, windshield wiper relay.
11. 5A – oxygen sensor (ZMZ-40522).
12. 15A – engine control system (ZMZ-40522).  
– microprocessor ignition system (ZMZ-4061, 4063),  
– engine control system power supply (GAZ-560, 5601, 5602).
13. 10A – turn indicator.

### **Lower fuse box fuses protect the circuits of:**

1. 25A – spare.
2. 15A – right headlamp main beam, main beam warning lamp.
3. 15A – left headlamp main beam.
4. 10A – right headlamp dipper beam.
5. 10A – left headlamp dipper beam.
6. 10A – fog lamps<sup>1)</sup>, fog lamps<sup>1)</sup> warning lamp.  
– rear fog lamp and rear fog warning lamp (GAZ-32214, 322174).
7. 20A – fog lamps, fog lamps warning lamp (GAZ-32214, 322174).
8. 20A – spotlight (above body side and rear doors – GAZ-32214, 322174).
9. 15A – cab dome lamp, freight compartment dome lamp, bus step dome lamp, underhood lamp, bus passenger compartment left row dome lamps.

<sup>1)</sup> Except for GAZ-32214, GAZ-322174 vehicles.

<sup>2)</sup> Installed on some of the vehicles.

- 10. 10A – instrument illumination, switches, cigarette lighter.
- 11. 5A – contactor (GAZ-32214, 322174).
- 12. 15A – right clearance light, headlamp aiming device, glovebox lamp.
- 13. 10A – left clearance light, clearance warning lamp, licence plate lamp.

**Note:** Vehicles are provided with the set of spare fuses. A fuse puller is available in the set of the spare fuses to assist removal of the faulty fuse.

## **8.9. THERMOSTARTER CONTROL UNIT**

(for vehicle with Sofim engine 8140. 43C)

Thermostarter control unit is located on the bracket in the right part of the front end panel. Depending on the ambient air temperature the control unit controls the cutting-in of the glow plug and the electromagnetic valve.

## **8.10. ANTI-LOCK BRAKE SYSTEM**

‘GAZelle’ buses are equipped with anti-lock brake system (ABS) of series 5.3 made by “Bosch”. ABS is effective in case of emergency braking on the roads with diverse road surface (example: asphalt-ice) and it prevents locking of the wheels being in the least favorable road adherence condition (on the ice) ensuring minimum braking distance of the vehicle for this road surface (ice) while maintaining its stability and steerability. Pulsating vibrations are felt on the brake pedal during ABS operation.

### **Attention!**

To get the best effect during emergency braking of the vehicle using ABS it is necessary to press the brake pedal with maximum effort pushing the clutch pedal simultaneously.

The electrical part of the ABS consists of 4 speed sensors located in the vehicle’s wheel assemblies, hydraulic unit with built-in control unit in the engine compartment on the left, ABS failure warning lamp in the instrument cluster and ABS<sup>1)</sup> harness.

ABS power circuit is connected directly to vehicle mains via separate 60A fuse in F41 fuse block and via ignition switch and 10A fuse in F42 fuse block.

The warning lamp lights up for two seconds each time the ignition is switched on and then goes out. It evidences that ABS system circuits connected to ABS unit are in sound condition. If the warning lamp lights continuously or it lights up during vehicle movement it indicates that ABS circuits went

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<sup>1)</sup> To determine the beginning of vehicle braking, stop signal switch is used.

out of order (but service brake system maintains serviceability as if without ABS)<sup>1)</sup>.

When ABS failure is confirmed the troubleshooting should be carried out at service station.

ABS electrical diagram is shown in Fig. 8.6.

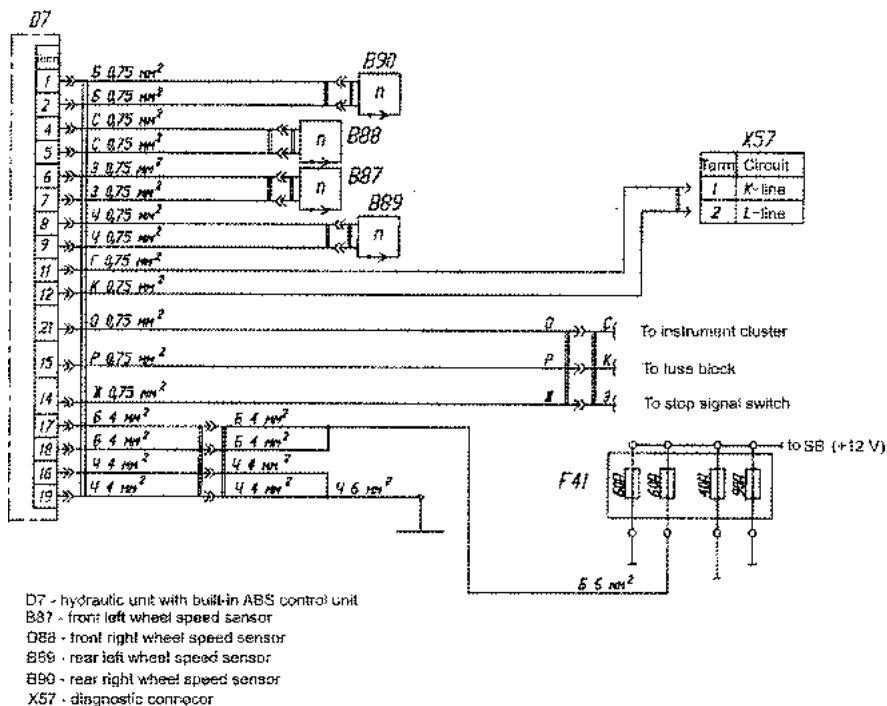


Fig.8.6. ABS System Electric Circuit Diagram

<sup>1)</sup> Moreover, ABS failure warning lamp lights up in case of wire breakage between ABS control unit and warning lamp.

## 9. VEHICLE MAINTENANCE

This section describes the works which should be carried out regularly within the intervals between the maintenance operations stated in the Service Book.

### 9.1. CHECKING ENGINE OIL LEVEL

Check engine oil daily prior to engine starting. When doing so park the vehicle on level ground.

The oil level must be between the upper and the lower marks on the oil dipstick. If oil level drops to the lower mark, add oil to bring it to the proper level.

Never run the engine with the oil level below the lower mark.

Pour fresh engine oil via the filler neck covered with the cap.

### 9.2. CHECKING OIL LEVEL IN GEARBOX, TRANSFER CASE (for 4WD Vehicles) AND REAR AXLE

Check oil level on an unladen vehicle standing on level ground with the units cold.

Oil level in the gearbox must be to the level of the filler hole lower edge – Fig. 9.1 (for the plug located on the right side) or 7 mm below the filler hole lower edge (for the plug located on the left side).

Oil level in the transfer case and the axle (Fig. 9.2) should be to the bottom edge of the filler hole.

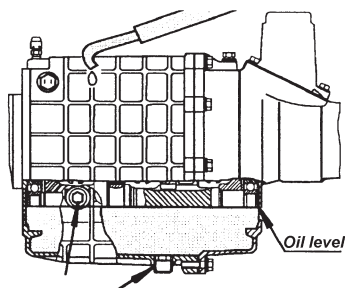


Fig. 9.1. Checking Oil Level in Gearbox:

- 1 – filler hole plug;
- 2 – drain hole plug

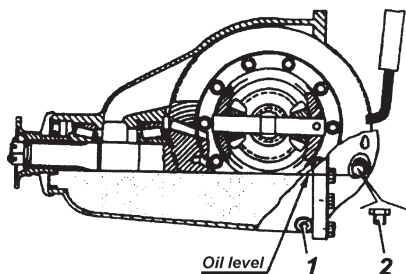


Fig 9.2. Checking Oil Level in Rear Axle

- 1 – drain hole plug;
- 2 – filler hole plug

### 9.3. CHECKING COOLANT LEVEL

Checking the coolant level in expansion tank 2 (Fig. 9.3) should be carried out only when the engine is cold.

The coolant level should be not below MIN mark and not above the clamp upper edge.

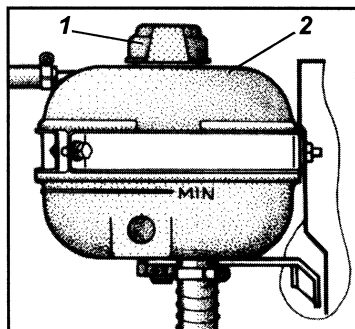


Fig. 9.3. Checking Coolant Level in Expansion Tank:

1 – plug; 2 – tank

Add anti-freeze mixture through the expansion tank hole covered by cap. If the coolant level falls frequently, inspect the cooling system for leakage.

### 9.4. CHECKING BRAKE FLUID LEVEL IN BRAKE MASTER CYLINDER TANK

The level of the brake fluid can be checked visually through semi-transparent tank 2 (Fig. 9.4) of brake master cylinder 1 by the level marks on the tank body.

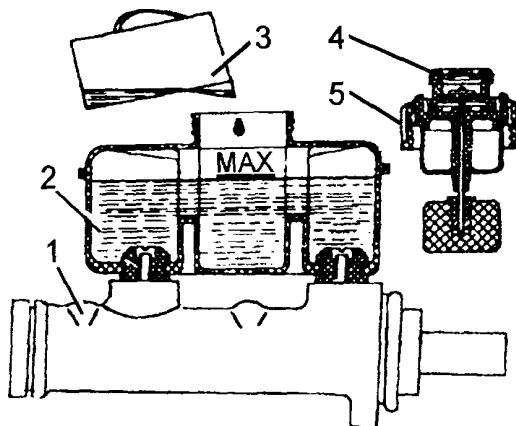


Fig. 9.4. Checking Brake Fluid Level in Master Cylinder Tank:

1 – brake master cylinder; 2 – tank; 3 – reservoir; 4 – cap; 5 – tank cover with sensor

With cover 5 removed and with new brake linings the fluid level should be at MAX mark. If the brake hydraulic drive is in sound condition, a drop of the fluid level is associated with brake lining wear. The fluid level drop up to MIN mark is indicative in an indirect way of maximum wear of the linings. In this case the linings should be renewed. But do not add the brake fluid into the tank because the fluid level in the tank will top up to normal after the installation of the new linings.

Brake fluid level low warning lamp comes on when the level in the tank drops below MIN mark. If the brake linings are new or partially worn, this is indicative of the loss of the system tightness and the fluid leakage. Top up the brake fluid in this case when the system tightness is restored only.

When checking the fluid level in the tank, it is necessary to check the brake fluid low level sensor as well. For this purpose depress the center portion of cap 4 when the ignition is turned on. The warning lamp should illuminate on the instrument cluster therewith.

### **9.5. CHECKING BRAKE FLUID LEVEL IN CLUTCH MASTER CYLINDER TANK**

The level of the brake fluid in the clutch master cylinder tank should be 15 – 20 mm below upper edge of the tank (Fig. 9.5).

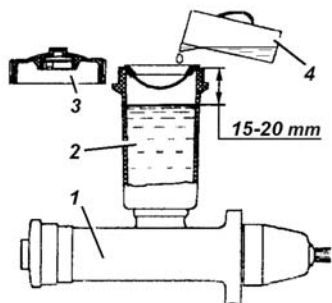


Fig. 9.5. Checking Fluid Level in Clutch Master Cylinder Tank

1 – service cylinder; 2 – tank; 3 – cap; 4 – reservoir

### **9.6. CHECKING STORAGE BATTERY ELECTROLYTE LEVEL**

Storage battery electrolyte level should be between MIN and MAX marks (Fig.9.6) on the semi-translucent battery housing and in case of their absence – to the lower edge of the filler hole.

If the electrolyte level is below the standard it is necessary to remove cover 1, unscrew filler plugs 2 and add distilled water through holes 3 up to the required level; then screw in plugs 2 having preliminary checked the vent holes

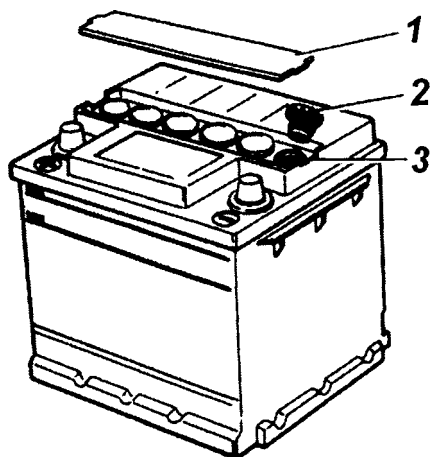


**Fig. 9.6. Storage Battery:**  
1 – cover; 2 – plug; 3 – filler hole

in them for cleanness and place back cover 1. After that wipe the battery outer surfaces with clean rags soaked in 10% solution of ammonia spirit or sodium bicarbonate.

Always keep the battery terminals and cable clamps clean as well as make sure that they are securely tight.

Care should be taken to ensure correct polarity when the battery is reconnected after removal from the vehicle (positive terminal is bigger than negative).

Prior to installation on the vehicle charge the battery bringing the density up to  $1.25\text{--}1.27\text{ g/cm}^3$ . Depending on climatic zone of the vehicle operation the electrolyte density should be corrected (see storage battery operating instructions).

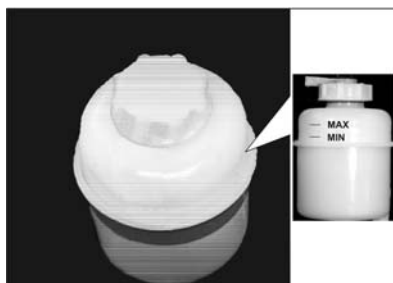
During the prolong parking of the vehicle disconnect the storage battery from the vehicle frame to ensure fire safety precautions.

### **9.7. CHECKING OIL LEVEL IN POWER STEERING RESERVOIR (power steering is mounted on some of the vehicles)**

Power steering system reservoir is installed under the hood on the bracket on the left side.

The level of oil should be between MAX and MIN marks available on the reservoir body.

Fig. 9.7. Checking the Oil Level in the Power Steering Reservoir



## 9.8. ENGINE ACCESSORIES DRIVE BELT TENSIONING

**ZMZ – 4061, 4063, 40522 Engines.** Engine accessories drive belt tensioning is carried out by changing the position of idler pulley 2 (Fig. 9.8).

Check the belt tension by the size of the belt sag using spring dynamometer. The belt sag «A» between alternator and water pump pulleys when pressing with 8 daN (8 kgf) force must be 15 mm.

To adjust the belt tension it is necessary to:

- loosen bolt 3 of the idler pulley;
- using shifting bolt 6, set pulley 2 into the position providing the required belt tension;
- tighten bolt 3;
- check the belt sag.

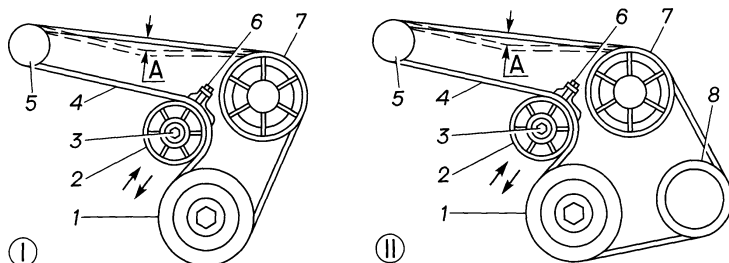


Fig. 9.8. Accessories Drive Belt Tension Diagram:

A=15 mm

I – for vehicles without power steering; II – for vehicles with power steering; 1 – crankshaft pulley; 2 – idler pulley; 3 – idler pulley fastening bolt; 4 – poly-V belt; 5 – alternator pulley; 6 – idler pulley shifting bolt; 7 – water pump pulley; 8 – power steering pump pulley (power steering system is mounted on some of the vehicles)

**Belt tensioning on GAZ-560, 5601, 5602 engines is carried out automatically.**

### 9.9. SPARK PLUGS (ZMZ-4061, 4063, 40522 ENGINES)

Gap «A» (Fig. 9.9) between the spark plug electrodes – see subsection 3.10 «Main adjustment and checking data». Check the gap between the electrodes with a round wire spark plug gapping gauge.

Adjust the gap by bending the side electrode. Clean the spark plugs from carbon deposit in a sand blasting machine. Never use steel objects for cleaning the insulator. The spark plugs are fitted with moulded radio frequency suppressing caps.

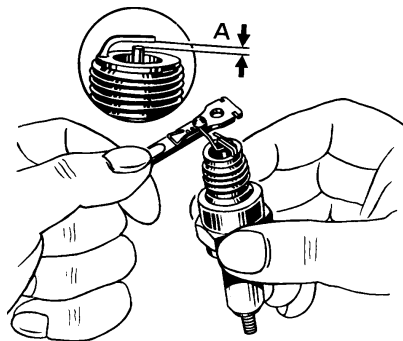


Fig. 9.9. Checking the Gap between the Spark Plug Electrodes

### 9.10. WHEELS AND TIRES CARE

In the process of vehicle operation it is necessary to timely tighten the loose wheel nuts to avoid damaging the fastening holes, remove rust from the wheels and restore their colour.

To ensure maximum service life of the tires the following rules should be observed:

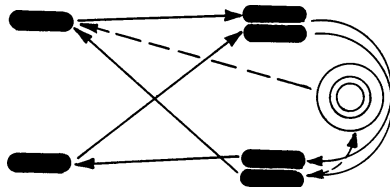
- maintain the required air inflation pressure in the tires. Pressure should be checked when the tires are cold before starting out. When stopping during a trip carry out visual inspection of the tires and inflation pressure in them. Never drive the vehicle with the underinflated tires. Pressure should not be reduced in warm tires because during the vehicle movement pressure increase is inevitable due to heating of air inside them;

- check and balance the wheels with tires on a special stand at the service station. For 2WD vehicles the allowable residual unbalance from each side of the wheel with tire should not exceed 40 g on the wheel rim, for 4WD vehicles – 45 g;

- on returning from a trip and when at halt inspect the tires and remove the foreign objects;

— rotate the tires, if necessary (Fig. 9.10). The grounds for tires rotation may serve the necessity to get even wear of all tires, spare one including, as well as to provide proper selection of the tires for each axle. The tires on an axle should be of the same tread wear and more reliable tires should be installed on the front axle of the vehicle.

Fig. 9.10. **Tire Rotation Diagram**



Maximum permissible rate of tread wear corresponds to residual depth of the tread grooves equal to 1.6 mm which is determined by measurement or by tread wear indicators. These indicators of 1.6 mm high will appear as wide bands incorporated in the tread pattern and marked on the tire sidewalls by TWI marks.

## 9.11. CHANGING A WHEEL

### 9.11.1. Wheel replacement by means of mechanical jack (GAZ-3302, 33023).

Wheel replacement should be carried out in the following sequence:

- apply the handbrake;
- place chocks at the front and rear of the wheel diagonally opposite the one to be removed;
- slacken six nuts of the wheel to be removed;
- place the jack (Fig. 9.11) under front axle girder or rear axle next to the wheel in question. Rotate the jack handle to lift the vehicle so that the wheel

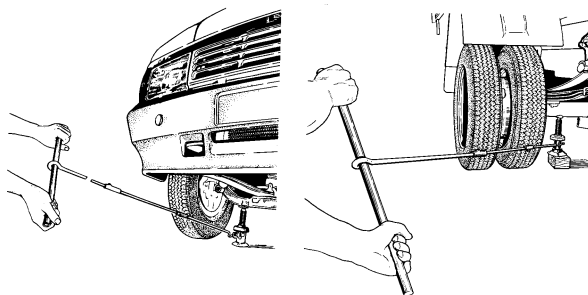


Fig. 9.11. **Vehicle Front and Rear Wheel Lifting**

clears the ground by 4–5 cm. In case of loose ground it is recommended to place a pad or a firm board under the jack base;

- remove six nuts, replace the wheel and fit the nuts;
- lower the vehicle;
- tighten the wheel nuts and remove the chocks;
- adjust the tire pressure.

When using the jack the following rules should be observed:

1. To maintain the vehicle stability, place the chocks under the wheels from the opposite side and apply the handbrake.

**2. Do not work beneath the vehicle with the lifting jack as the only support.**

To carry out adjustment and mounting/dismounting operations lift the vehicle on the jack and then lower it on suitable stands.

3. Avoid fouling of threaded surfaces of screws and periodically apply graphite grease on them.

#### **9.11.2. Wheel replacement using hydraulic jack (buses, vans and 4WD vehicles).**

Replace the wheel in the following sequence:

- apply the handbrake;
- place chocks under the wheels from the side opposite to the wheel to be removed;
- loosen six nuts of the wheel to be removed;

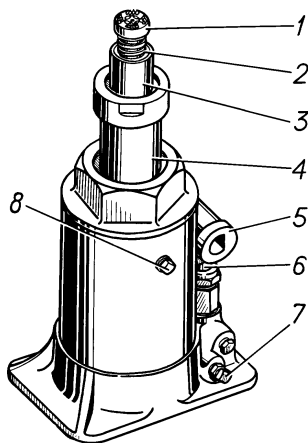


**Fig. 9.12. Jack**

- 1 – head; 2 – screw; 3 and 4 – operating plungers;  
5 – handle; 6 – delivery plunger; 7 – shut-off needle;  
8 – plug

— place the jack (Fig. 9.12) under front axle beam or rear axle near the wheel to be lifted and drive out screw 2 as far as it will go. In case of loose ground, place a pad or a firm board under the jack base;

— screw shut-off needle 7 all the way clockwise, insert tommy bar into handle 5 and rocking the tommy bar make lifting of the vehicle so that the wheel clears the ground by 4–5 cm;

In case of failure of lifting by the jack, open shut-off needle 7 and rock the tommy bar several times to remove air which could get into the working chamber.

— remove six nuts, replace the wheel and fit the nuts;

— lower the vehicle slowly opening shut-off needle 7 of the jack by turning it in a counterclockwise direction;

— tighten six nuts and remove the chocks;

— adjust the tire pressure.

When using and storing the jack the following rules should be observed:

1. To maintain vehicle stability place chocks under the wheels of the opposite side and apply the handbrake.

**2. Do not work beneath the vehicle with the lifting jack as the only support.**

To carry out adjustment and mounting/dismounting operations lift the vehicle on the jack and then lower it on suitable stands.

3. In storage, jack screw 2 should be driven all the way in, the operating and delivery plungers must take the lowermost position and shut-off needle 7 be unscrewed through 1 or 2 revolutions.

4. Fill the jack with clear filtered oil BMГ3-C or MГE-10A up to the level of the filler hole.

At the ambient air temperature up to  $-40^{\circ}\text{C}$  application of transformer oil is permissible.

Never use oils of other grades and liquids including brake fluid.

### **9.12. BODY (CAB) CARE**

Wash the bodywork of the vehicle in a shadow. Do not use soda, kerosene, gasoline as well as seawater. If after washing with water the bodywork is not clean enough you may use shampoo and other vehicle cosmetics available in the market.

Use clean sponge and soft cloth with plenty of water and do not rub too hard. Tar spots should be removed with castor or petrolatum oil. A mild soap solution or pure water may easily clean the plastic parts.

Never use gasoline or solvents for the above purpose.

On detecting corrosive spots it is necessary to remove the rust to pure metal, prime and apply corrosion-resisting mastic.

You should not keep the vehicle under rubberised cover or place rubber articles on bodywork painted surface because dark spots may appear which cannot be removed with car polish.

To retain elasticity of rubber seals at low temperatures , it is recommended to smear them with glycerine at regular intervals.

In the process of vehicle operation non-corrosive coating may fail with time that is why it is necessary to perform corrosion-resisting treatment at regular intervals at service stations.

### 9.13. TYPES OF MAINTENANCE

1. Daily maintenance (EO).
2. Maintenance one “A” – after 10000 km of run.
3. Maintenance two “B” – after 20000 km of run.
4. Seasonal maintenance “C”.

Seasonal maintenance is performed once a year along with maintenance one “A” or two “B”.

### 9.14. PROCEDURES CARRIED OUT DURING MAINTENANCE

#### 9.14.1. Daily maintenance (EO)

| Procedure description                                                              | Specifications                                                                                                                                              | Tools and materials  |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| 1                                                                                  | 2                                                                                                                                                           | 3                    |
| Check the level of:                                                                |                                                                                                                                                             |                      |
| – oil in engine crankcase                                                          | See item 9.1                                                                                                                                                | Visually             |
| – fluid in cooling system                                                          | See item 9.3                                                                                                                                                | Visually             |
| – fluid in clutch master cylinder tank                                             | See item 9.5                                                                                                                                                | Visually             |
| – oil in power steering reservoir (for vehicles with power steering) <sup>1)</sup> | See item 9.7                                                                                                                                                | Visually             |
| – fluid in brake master cylinder tank.                                             | See item 9.4                                                                                                                                                | Visually             |
| Check service brake system for sound condition.                                    | 1. With the engine running, the brake pedal should not reach the cab floor.<br>Clearance between the cab floor and the pedal should be not less than 25 mm. | Visually<br><br>Rule |

<sup>1)</sup> In case of oil low level in the reservoir, check power steering system for tightness.

| 1                                                                                  | 2                                                                                                                                                                                                | 3         |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
|                                                                                    | 2. When the ignition is on:<br>– brake fluid low level warning lamp should not illuminate;<br>– on pressing the cap, brake fluid low level warning lamp should illuminate                        | Visually  |
| Check operation of parking brake system                                            | Parking brake handle should move for not more than 15–20 teeth under 60 kgf effort                                                                                                               |           |
| Check tire inflation pressure, bring to the specified, if required                 | Check when tires are cold. Air inflation pressure values see in subsection 3.10 “Main adjustment and checking data”                                                                              | Manometer |
| Check steering wheel total play                                                    | Total play over steering wheel rim should not exceed 37 mm (35 mm <sup>1)</sup> ) for buses and 45 mm (43 mm <sup>1)</sup> ) for the rest of the vehicles in each side from the neutral position | Rule      |
| Check operation of instruments, windshield wiper, illumination and warning devices | With the engine running make sure that the devices are in sound condition by their successive turning on                                                                                         | Visually  |

### 9.14.2. Periodic maintenance

*Procedures for periodic maintenance are stated in the service book supplied with the vehicle.*

### 9.14.3. Vehicle lubrication

1. Never use fuels, oils and liquids of other grades except for those specified in subsections 9.15. and 9.16.

2. Prior to lubrication remove dirt from grease nipples and plugs to avoid its penetration into the vehicle’s mechanisms.

3. Lubricate with grease gun until fresh lubricant comes out from all joints and sealings.

4. When the engine oil is changed for another grade or company the lubricating system should be flushed with flushing oil.

Never mix (top up) engine oil of different grades and different companies.

<sup>1)</sup> For vehicles with power steering.

## 9.15. OILS, LUBRICANTS AND SPECIAL FLUIDS

| Description of lubrication points                              | Number of points        | Quantity of lubricant        | Description of lubricant                                                                                                                                                                        |
|----------------------------------------------------------------|-------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                                              | 2                       | 3                            | 4                                                                                                                                                                                               |
| Engine oil system (ZMZ-4061, ZMZ-4063, ZMZ-40522)              | 1                       | 6 l                          | See table "Equivalents of oils, lubricants and fluids"                                                                                                                                          |
| Engine oil system (GAZ-560, GAZ-5601, 5602)                    | 1                       | 6.5 l                        | See table "Equivalents of oils, lubricants and fluids"                                                                                                                                          |
| Engine oil system (Sofim 8140. 43C)                            | 1                       | 5.6 l                        | See table "Equivalents of oils, lubricants and fluids"                                                                                                                                          |
| Gearbox case                                                   | 1                       | 1.2 l                        | At the temperature from –25° C to +40° C – oil "Супер Т-3"<br>Substitute – oils TC <sub>п</sub> -15K; "Девон Супер Т"<br>At the temperature from –40° C to +20° C – oil "Лукойл ТМ5" SAE 75W-90 |
| Transfer case housing <sup>1)</sup>                            | 1                       | 1.65 l                       | At the temperature from –25° C to +40° C – oil "Супер Т-3"<br>Substitute – oils TC <sub>п</sub> -15K; "Девон Супер Т"<br>At the temperature from –40° C to +20° C – oil "Лукойл ТМ5" SAE 75W-90 |
| Universal joint needle bearings                                | 3<br>(6 <sup>1)</sup> ) | 60 g<br>(120 <sup>1)</sup> ) | Oil "Супер Т-3"; Substitute – oils "Девон Супер Т"                                                                                                                                              |
| Splined joints <sup>1)</sup> of propeller shafts               | 2                       | 100 g                        | Oil "Супер Т-3"; Substitute – oils "Девон Супер Т"                                                                                                                                              |
| Front axle housing <sup>1)</sup>                               | 1                       | 1.8 l                        | At the temperature from –25° C to +40° C – oil "Супер Т-3"<br>Substitute – oils "Девон Супер Т"<br>At the temperature from –40° C to +20° C – oil "Лукойл ТМ5" SAE 75W-90                       |
| Steering knuckle <sup>1)</sup> pivot bushes and block bearings | 4                       | 30 g                         | Solid oil C<br>Substitute – solid oil Ж                                                                                                                                                         |
| Steering knuckle <sup>2)</sup> pivot bushes and block bearings | 2                       | 25 g                         | Solid oil Ж<br>Substitute – solid oil C                                                                                                                                                         |

<sup>1)</sup> For 4WD vehicles.

<sup>3)</sup> For 2WD "GAZelle" vehicles.

| 1                                                        | 2                                  | 3                         | 4                                                                                                                                                                            |
|----------------------------------------------------------|------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Front axle joint cross bearings <sup>1)</sup>            | 8                                  | 24 g                      | Lubricant 158M                                                                                                                                                               |
| Rear axle housing                                        | 1                                  | 3.0 l                     | At the temperature from –25° C to +40° C – oil “Супер Т-3”<br>Substitute – oils “Девон Супер Т”<br>At the temperature from –40° C to +20° C – oil “Лукойл ТМ5”<br>SAE 75W-90 |
| Rear wheel hub bearings                                  | 4                                  | 66 g                      | At the temperature from –25° C to +40° C – oil “Супер Т-3”<br>Substitute – oils “Девон Супер Т”<br>At the temperature from –40° C to +20° C – oil “Лукойл ТМ5”<br>SAE 75W-90 |
| Front wheel hub bearings                                 | 4                                  | 110g <sup>1)</sup><br>270 | Grease Литол-24<br>Grease Литол-24. Substitutes – grease ЛИТА                                                                                                                |
| Front <sup>2)</sup> axle joint outer fork splines        | 2                                  | 10 g                      | Grease Литол-24. Substitutes – grease ЛИТА, solid oil C or Ж                                                                                                                 |
| Front axle journal <sup>2)</sup> seal                    | 2                                  | 10 g                      | Grease Литол-24. Substitutes – greases ЛИТА, solid oil C or Ж                                                                                                                |
| Shock absorbers                                          | 4 <sup>2)</sup><br>2 <sup>3)</sup> | 1.06 l<br>0.53 l          | АЖ-12Т. Substitute fluid – spindle oil АУ                                                                                                                                    |
| Idle arm shaft needle bearings <sup>3)</sup>             | 1                                  | 50g                       | Lubricant УссА<br>Substitute : Solid oil Ж                                                                                                                                   |
| Left idle arm support washer <sup>3)</sup>               | 1                                  | 2g                        | Lubricant УссА<br>Substitute : Solid oil Ж                                                                                                                                   |
| Right idle arm bushings <sup>3)</sup>                    | 2                                  | 15g                       | Lubricant УссА<br>Substitute : Solid oil Ж                                                                                                                                   |
| Steering gear case (for vehicles without power steering) | 1                                  | 0.55–0.6 l                | Oil “Супер Т-3”; Substitute – oils “Девон Супер Т”                                                                                                                           |
| Power steering system (for vehicles with power steering) | 1                                  | 1.3l                      | Oil “Р”                                                                                                                                                                      |
| Steering shaft seal                                      | 1                                  | 5 g                       | Grease Литол-24. Substitutes – grease ЛИТА                                                                                                                                   |

<sup>1)</sup> When replacing the bearings.

<sup>2)</sup> For 4WD vehicles.

<sup>3)</sup> For 2WD vehicles.

| 1                                                      | 2                         | 3                                           | 4                                                              |
|--------------------------------------------------------|---------------------------|---------------------------------------------|----------------------------------------------------------------|
| Steering gear universal joints                         | 4                         | 7 g                                         | Grease Литол-24. Substitutes – grease solid oil C, solid oil Ж |
| Master brake cylinder refilling tank                   | 1                         | 0.67 l                                      | Brake fluid “РОСДОТ”. Substitute fluid “Томь”                  |
| Master clutch cylinder refilling tank                  | 1                         | 0.2 l                                       | Brake fluid “РОСДОТ”. Substitute fluid “Томь”                  |
| Storage battery terminals                              | 2                         | 10 g                                        | Lubricant ПВК or solid oil                                     |
| Door locks and linkages (inner and outer)              | 14<br>(28 <sup>1)</sup> ) | 20 g<br>(40 g <sup>1)</sup> )               | Oil ВМГЗ or МГЕ10А                                             |
| Door lock releases                                     | 2<br>(4 <sup>1)</sup> )   | 4 g<br>(8 g <sup>1)</sup> )                 | Grease Литол-24. Substitutes – grease ЛИТА                     |
| Cab door limiters                                      | 2                         | 2 g                                         | Grease Литол-24. Substitutes – grease ЛИТА                     |
| Sliding surfaces of side door <sup>1)</sup> mechanisms | 3                         | 30 g                                        | Grease Литол-24. Substitutes – grease ЛИТА                     |
| Hood lock                                              | 1                         | 1 g                                         | Oil ВМГЗ or МГЕ10А                                             |
| Hood lock control                                      | 1                         | 15 g                                        | Grease Литол-24. Substitutes – grease ЛИТА                     |
| Hood hinges                                            | 2                         | 2 g                                         | Oil ВМГЗ or МГЕ10А                                             |
| Side door <sup>1)</sup> upper roller bearing           | 1                         | 20 g                                        | Литол-24, ЛИТА or ЦИАТИМ-201                                   |
| Cooling system of ZMZ-4061, 4063, ZMZ-40522 engines    | 1                         | 9.7 l <sup>2)</sup><br>11.5 l <sup>3)</sup> | Coolant ТОСОЛ-А40М, ОЖ-40 «Лена», ТЕРМОСОЛ-А40                 |
| Cooling system of Sofim 8140. 43C engine               | 1                         | 6 l <sup>2)</sup><br>7.8 l <sup>3)</sup>    | Coolant ТОСОЛ-А40М, ОЖ-40 «Лена», ТЕРМОСОЛ-А40                 |
| Cooling system of GAZ-560, GAZ-5601, 5602 engines      | 1                         | 8.2 l <sup>2)</sup><br>10 l <sup>3)</sup>   | Coolant ТОСОЛ-А40М, ОЖ-40 «Лена», ТЕРМОСОЛ-А40                 |

**Note:** Fuel tank capacity, l: – metal tank – 64<sup>+2</sup>; – plastic tank – 60.

<sup>1)</sup> For vans and buses.

<sup>2)</sup> For vehicles with one heater.

<sup>3)</sup> For vehicles with two heaters (buses and vans with two rows of seats, GAZ-32214, GAZ-322174).

## 9.16. EQUIVALENTS OF FUELS, OILS LUBRICANTS AND FLUIDS

### General

1. Never mix up the foreign and home made fuels, oils and lubricants.
2. Prior to using oil of foreign grade, be sure to flush the oil system.

### Diesel Fuels

(for GAZ-560, GAZ-5601, 5602, Sofim 8140. 43C engines)

| Russian fuel           | Foreign diesel fuel                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                        |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Grade                  | Grade                                                                                                                                                                                                                                            | Specification                                                                                                                                                                                                                                                                          | Country                                                                                                                                                                                |
| 1                      | 2                                                                                                                                                                                                                                                | 3                                                                                                                                                                                                                                                                                      | 4                                                                                                                                                                                      |
| II<br>(diesel, summer) | II, IIE, 3<br>0, -10, Könnnyü<br>LS, LW, Z-20, DS II<br>POMAN, +5, -5, -10,<br>-15, -25, LD<br>—<br>2D<br>Class C1, Class C2,<br>Class A1, Class D,<br>Class A2<br>Class M1<br>—<br>—<br>—<br>—<br>—<br>EO1<br>—<br>TYPE B<br>Special N1, N2, N3 | БДC 8884<br>MSZ 1627-74<br>PN-67/C-96048<br>STAS 240-80<br><br>ONORM C 1104-75<br>ASTM 975-81<br><br>BS 2869-83<br><br>BSMA 100-82<br>M 15007-82<br>NFM 15009-76<br>DIN 51601-78<br>DIN 51603-81<br>SN 181160/1-83<br>SS 155103-81<br>SS 155432-84<br>CAN 2-3, 6-M-83<br>JIS K-2201-83 | Bulgaria<br>Hungary<br>Poland<br>Romania<br><br>Austria<br><br>USA<br><br>UK<br><br>UK<br>France<br>France<br>Germany<br>Germany<br>Switzerland<br>Sweden<br>Sweden<br>Canada<br>Japan |
| 3<br>(diesel, winter)  | Z-35, Z-50<br>-35<br>ID<br>Special N3<br>TYPE A, TYPE AA                                                                                                                                                                                         | PN-67/C-96048<br>STAS 240-80<br>ASTM 975-81<br>JIS K-2204-83<br>CAN 2-3, 6-M-83                                                                                                                                                                                                        | Poland<br>Romania<br>USA<br>Japan<br>Canada                                                                                                                                            |
| A<br>(diesel, arctic)  | Z-50<br>TYPE AA                                                                                                                                                                                                                                  | PN-67/C-96048<br>CAN 2-3, 6-M-83                                                                                                                                                                                                                                                       | Poland<br>Canada                                                                                                                                                                       |

**Note:** Symbol «—» without figures in column 2 indicates that fuel trade mark is not available and standard defines the grade.

## Oils, lubricants and fluids

| Russian made materials                     | Classification, equivalents specification                                                                                                                     | Remarks                                                                                                                                                                                                                                                             |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                          | 2                                                                                                                                                             | 3                                                                                                                                                                                                                                                                   |
| Engine oils<br>(ZMZ-4061, 4063, ZMZ-40522) | API SG, SH, SJ/CD<br>SAE 5W-30<br>SAE 5W-40<br>SAE 10W-30<br>SAE 10W-40<br>SAE 15W-30<br>SAE 15W-40<br>SAE 20W-30<br>SAE 20W-40<br>SAE 30<br>SAE 40<br>SAE 50 | from -25° C to +20° C<br>from -25° C to +35° C<br>from -20° C to +30° C<br>from -20° C to +35° C<br>from -15° C to +35° C<br>from -15° C to +45° C<br>from -10° C to +45° C<br>from -10° C to +45° C<br>from -5° C to +45° C<br>from 0° C to +45° C<br>above +45° C |
| (GAZ-560, GAZ-5601, 5602)                  | SAE 15W-40<br>SAE 5W-40<br>SAE 5W-50<br>SAE 10W-40<br>SAE 40                                                                                                  | from -15° C to +45° C<br>from -25° C to +35° C<br>from -25° C to +40° C<br>from -20° C to +35° C<br>from 0° C to +45° C                                                                                                                                             |
| (Sofim 8140. 43C)                          | SAE 15W-40<br>SAE 5W-40<br>ACEA E2 or E3                                                                                                                      | from -10° C to +45° C<br>from -25° to 0° C                                                                                                                                                                                                                          |
| Transmission oils                          | API GL-5<br>SAE 85W 90                                                                                                                                        |                                                                                                                                                                                                                                                                     |
| Oil «P»                                    | ISO-6074-HM-22                                                                                                                                                | Shell Tellus 22, Mobil DTE -13, Castrol Hyspin AWS 22                                                                                                                                                                                                               |
| Oil «A»                                    | ATF                                                                                                                                                           |                                                                                                                                                                                                                                                                     |
| Oil МГЕ-10А                                | ISO-6079-HV-15                                                                                                                                                |                                                                                                                                                                                                                                                                     |
| Oil БМГЗ                                   | ISO-6074-HV-15                                                                                                                                                |                                                                                                                                                                                                                                                                     |
| Lubricant ЦИАТИМ-201                       | Mil-G-24139<br>Mil-G-19608<br>DEF STAN 91-28, DTD 577                                                                                                         |                                                                                                                                                                                                                                                                     |
| Grease Литол-24                            | Mil-G-18709A,<br>Mil-G-10924C                                                                                                                                 |                                                                                                                                                                                                                                                                     |
| Grease ЛИТА                                | SM-1C-4515A (Ford)                                                                                                                                            |                                                                                                                                                                                                                                                                     |
| Solid oil C or Ж                           | VWTL-738, Mil-G-10924C,<br>SMIC-74A(Ford)                                                                                                                     |                                                                                                                                                                                                                                                                     |
| Graphite grease УССа                       | VV-G-671d 078.01 (RFA)                                                                                                                                        | Barbatia 2,3,4 (Shell)<br>Graphited No 3 (Mobil)                                                                                                                                                                                                                    |
| Cooling liquid ТОСОЛ-А40М or ОЖ-40 «Лена»  | Antifreeze with inhibitor<br>corrosion complex and foam<br>quencher                                                                                           | Use following the vehicle<br>Selling Dealer recommenda-<br>tions                                                                                                                                                                                                    |
| Brake fluid «РОСДОТ» or «Томь»             | DOT-3 or Dot-4, SAE 1 1703f,<br>FMVSS 116A                                                                                                                    |                                                                                                                                                                                                                                                                     |

While choosing the lubricant or fluid give preference to the following firms: Shell, Mobil, Castrol, British Petroleum, Agip, Gulf.

## 9.17. PARTS TO BE REPLACED ON THE VEHICLE DURING MAINTENANCE

During vehicle maintenance the following parts are subject to replacement:

1. Fuel fine filter of ZMZ-4061, ZMZ-4063 and ZMZ-40522 engines (replaced in assembly), filter designation is 2108-1117010-03 or 4021.1117010).

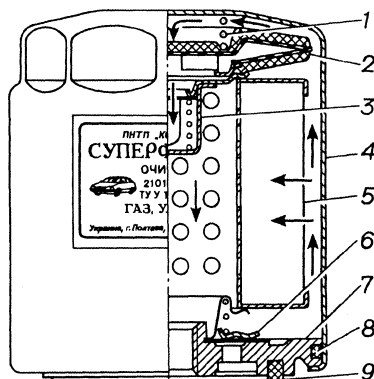
Fuel fine filter of Sofim 8140. 43C engine is 1 457 434 106 (as per catalogue BOSCH). It is allowed to use 1902138 5400-20 6432012 (as per catalogue IVECO N 60339013).

2. Filter element of GAZ-560, GAZ-5601, 5602 engine fuel fine filter – 560-1117040. It is allowed to use 740-1117040 filter element with compulsory replacement in 10000 km of run.

3. Oil filter in assembly of ZMZ-4061, ZMZ-4063 and ZMZ-40522 engines – 2101C-101205-HK-2. The above mentioned filter (Fig. 9.14) is full-flow and non-detachable one ensuring high quality of fuel cleaning (ПНТП «КОЛАН» make).

Fig. 9.14. Oil Filter:

- 1 – spring; 2 – by-pass valve filter element;  
3 – by-pass valve; 4 – body; 5 – filter element;  
6 – drain-proof valve; 7 – cover; 8, 9 – gaskets



2101C-1012005-HK-2 filter provides that no dirty oil will enter the engine lubricating system (unlike the filters of common design). When starting cold engine or at maximum clogging of filter element 5, cleaning and feeding of oil are performed through filter element 2 and by-pass valve 3.

If you have failed to purchase «КОЛАН» filter it is allowed to use foreign made oil filters L17200 “Puralator” and C102, C113, C117, C149 “Champion” on ZMZ-4061, 4063 and 40522 engines.

However it necessary to note that when starting cold engine or at clogging of filter element (when using the above filters – substitutes) the by-pass valve opens allowing the dirty oil to enter the engine lubricating system.

For GAZ-560 and GAZ-5601, 5602 engines it is recommended to use filter elements (non-detachable, full-flow): Fleetguard LF3402 and LF3449, Knecht OC59 (F0371), Mann W940 or W940/15N.

Filter element of Sofim 8140. 43C engine oil filter is RD303 45.303.000.53.

4. Filter element of ZMZ-4061, ZMZ-4063 and ZMZ-40522 engine air filter – 3102-1109013 (-03, -04, -05, -06) or 31029 (-01, -02, -03).

Filter element of GAZ-560, GAZ-5601, 5602 engine air filter – 3105-1109013, 3110-1109013 or 3110-1109013-13-01.

Filter element of Sofim 8140. 43C engine air filter is 3302-1109010-10.

5. Spark plugs (ZMZ-4061, ZMZ-4063 and ZMZ40522 engines) – see “Specifications”, subsection 3.10.

6. Filter element of power steering system<sup>1)</sup> reservoir ШНХФ 453473.400.

In case of installation of power steering system<sup>1)</sup> reservoir ЯМ3.993.004 the latter is replaced in assembly.

---

<sup>1)</sup>Power steering system is mounted on some of the vehicles.

## 10. SUPPLEMENTS

Supplement 1

### 10.1. ELECTRIC BULBS USED

| Purpose and location                                                    | Type                            | Quantity             |
|-------------------------------------------------------------------------|---------------------------------|----------------------|
| Head lamps:                                                             |                                 |                      |
| low beam                                                                | H7                              | 2                    |
| high beam                                                               | H1                              | 2                    |
| clearance light                                                         | W5W                             | 2                    |
| turn indicator                                                          | PY21W                           | 2                    |
| Turn indicator repeaters                                                | WY5W                            | 2                    |
| Cab dome lamp                                                           | AC12-5-1                        | 3                    |
| Cab second row seats dome lamp (for vans with two rows of seats in cab) | KЛ9Y/ТБЦ                        | 2                    |
| Bus passenger compartment dome lamps                                    | KЛ9Y/ТБЦ                        | 3 (4 <sup>1)</sup> ) |
| Bus step lighting dome lamp                                             | AC12-5-1                        | 1                    |
| Van freight compartment dome lamp                                       | AC12-21-3                       | 1                    |
| Dome lamp <sup>2)</sup> individual above the table                      | A12-4-1                         | 1                    |
| Glove box dome lamp                                                     | AC12-5-1                        | 1                    |
| Rear fog lamp (buses and vans version)                                  | A12-21-3                        | 1                    |
| Hood light                                                              | A-12-10                         | 1                    |
| Tail light:                                                             |                                 |                      |
| turn indicator                                                          | A12-21-3                        | 2                    |
| stop-light                                                              | A12-21-3 or A12-21-5            | 2                    |
| clearance light                                                         | A12-5 or A12-21-5               | 2                    |
| fog light                                                               | A12-21-3                        | 2                    |
| backing light                                                           | A12-21-3                        | 2                    |
| Licence plate light                                                     | AC12-5-1, A12-3-1 <sup>1)</sup> | 2                    |
| Alarm switch pilot lamp                                                 | A12-1,1                         | 1                    |
| Inspection lamp                                                         | A12-6-2                         | 1                    |
| Cigarette lighter socket light                                          | AMH12-3-1                       | 1                    |
| Instrument cluster lighting bulbs                                       | A12-2,3-1                       | 4                    |
| Pilot lamps                                                             | A12-1,2                         | 22                   |

<sup>1)</sup> For "Sobol" buses with 6 passenger seats.

<sup>2)</sup> For "Sobol" vehicles.

## 10.2. TIGHTENING TORQUE OF MOST IMPORTANT JUNCTIONS<sup>1)</sup>

| Junction description                                                                                      | Tightening torque,<br>daN·m (kgf·m) |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------|
| 1                                                                                                         | 2                                   |
| <b>Engine ZMZ-4061, 4063, 40522</b>                                                                       |                                     |
| Cylinder head hold-down bolts                                                                             |                                     |
| preliminary tightening                                                                                    | 4.0 – 6.0                           |
| final tightening                                                                                          | 13.0 – 14.5                         |
| Connecting rod nuts                                                                                       | 6.8 – 7.5                           |
| Main bearing cap bolts                                                                                    | 10.0 – 11.0                         |
| Flywheel bolts                                                                                            | 7.2 – 8.0                           |
| Clutch case bolts                                                                                         | 4.2 – 5.1                           |
| Crankshaft bolt                                                                                           | 17.0 – 22.0                         |
| Clutch pressure plate bolts                                                                               | 2.0 – 2.5                           |
| Camshaft cap bolts                                                                                        | 1.9 – 2.3                           |
| Camshaft sprocket hold-down bolts                                                                         | 5.6 – 6.2                           |
| Intermediate shaft sprocket hold-down bolts                                                               | 2.2 – 2.5                           |
| Rocker cover bolts                                                                                        | 0.5 – 0.8                           |
| Intake pipe nuts, clutch case reinforcing element bolts                                                   | 2.9 – 3.6                           |
| Water pump, water pump pulley, thermostat housing, chain damper, chain cover bolts, exhaust manifold nuts | 2.0 – 2.5                           |
| Cylinder head front cover, idler pulley bolts                                                             | 1.4 – 1.8                           |
| Oil crankcase hold-down bolts                                                                             | 1.2 – 1.8                           |
| Oil seal holder bolts                                                                                     | 0.6 – 0.9                           |
| <b>Transmission</b>                                                                                       |                                     |
| Transfer case shaft flanges nuts <sup>2)</sup>                                                            | 20 – 28                             |
| Gear cases bolts                                                                                          | 1.4 – 1.8                           |
| Front and rear gear case and transfer case covers bolts <sup>2)</sup>                                     | 1.4 – 1.8                           |
| Cardan drive intermediate support to frame cross-member hold-down nuts                                    | 1.2 – 1.8                           |
| Cardan drive to transfer case <sup>2)</sup> , front <sup>2)</sup> and rear axles hold-down nuts           | 2.7 – 3.0                           |
| Rear propeller shaft universal joint knuckle hold-down bolt (for 2WD vehicles)                            | 4.0 – 4.4                           |
| Front axle driving flange nuts <sup>2)</sup>                                                              | 11 – 12.5                           |

<sup>1)</sup> Tightening torques are stated for checking at repairs and maintenance.

<sup>2)</sup> For 4WD vehicles.

| 1                                                                       | 2                            |
|-------------------------------------------------------------------------|------------------------------|
| Steering knuckle arm nuts <sup>1)</sup>                                 | 11 – 12.5                    |
| Journal nuts <sup>1)</sup>                                              | 11 – 12.5                    |
| Rear axle reduction gear hold-down bolts                                | 5.5 – 7.0                    |
| Front <sup>1)</sup> and rear axle driving gear nut                      | 16.0 – 20.0                  |
| Semi-axle nuts                                                          | 3.3 – 4.1                    |
| <b>“GAZelle” Vehicle Running Gear</b>                                   |                              |
| Silent-block bolts                                                      | 12.0 – 15.0                  |
| U-bolt nuts                                                             | 12.0 – 15.0                  |
| Shock absorber reservoir nuts                                           | 9.0 – 15.0                   |
| Wheel nuts                                                              | 30.0 – 38.0                  |
| Steering knuckle pivot lock pin nuts <sup>1)</sup>                      | 3.2 – 3.6                    |
| <b>“Sobol” Vehicle Running Gear</b>                                     |                              |
| Trunnion hold-down bolts                                                | 10.0 – 12.5                  |
| Trunnion to suspension support hold-down bolts                          | 7.0 – 10.0                   |
| Lower joint to support hold-down bolts                                  | 5.5 – 7.0                    |
| Upper joint to upper arm hold-down nuts                                 | 5.5 – 7.0                    |
| Silent-block bolts of springs                                           | 12.0 – 15.0                  |
| U-bolt nuts                                                             | 12.0 – 15.0                  |
| Shock absorber reservoir nuts of rear suspension                        | 9.0 – 15.0                   |
| Wheel nuts                                                              | 15. – 17.0                   |
| Steering knuckle pivot lock pin nuts <sup>1)</sup>                      | 3.2 – 3.6                    |
| <b>Steering Gear</b>                                                    |                              |
| Steering rod ball joint nuts                                            | 7.0 – 10.0                   |
| Steering arm to steering knuckle hold-down bolts<br>(“GAZelle” vehicle) | 11.0 – 12.5                  |
| Tie rod clamp bolts (“GAZelle” vehicle)                                 | 2.2 – 2.5                    |
| Steering links to support hold-down bolts (“Sobol” vehicle)             | 11.0 – 12.5                  |
| Idler arms to shafts hold-down nuts (“Sobol” vehicle)                   | 14.0 – 18.0                  |
| Connecting rod tube clamp nuts (“Sobol” vehicle)                        | 1.5 – 1.8                    |
| Steering gear bracket to girder hold-down nuts                          | 4.4 – 5.6                    |
| Steering gear to bracket hold-down bolts                                | 4.4 – 6.2                    |
|                                                                         | (16.0 – 20.0 ) <sup>2)</sup> |
| Steering wheel nut                                                      | 6.5 – 8.0                    |
| Pitman arm nut                                                          | 10.5 – 14.0                  |
| Cotter nut                                                              | 1.8 – 2.5                    |

<sup>1)</sup> For 4WD vehicles.

<sup>2)</sup> For vehicles with power steering.

| 1                                                      | 2           |
|--------------------------------------------------------|-------------|
| <b>Brake system</b>                                    |             |
| Brake calipers to steering knuckles hold-down bolts    | 10.0 – 12.5 |
| Brake carrier plate bolts                              | 5.0 – 6.2   |
| Brake cylinder bolts                                   | 1.4 – 2.0   |
| Master brake cylinder to vacuum booster hold-down nuts | 2.4 – 3.6   |
| Vacuum booster nuts                                    | 1.2 – 1.7   |

Supplement 3

### 10.3. Filling Capacities

|                                                                      |                                  |
|----------------------------------------------------------------------|----------------------------------|
| Fuel tank, l                                                         | 64                               |
| Engine cooling system, l:                                            |                                  |
| – with one heater                                                    | 9.7 (8.2) <sup>1)</sup>          |
| – with additional heater (for buses and vans with two rows of seats) | 11.5 (10.0) <sup>1)</sup>        |
| Engine oil system, l                                                 | 6.0 (6.5) <sup>1)</sup>          |
| Gearbox case, l                                                      | 1.2                              |
| Transfer case housing <sup>2)</sup> , l                              | 1,65                             |
| Front axle housing <sup>1)</sup> , l                                 | 1.8                              |
| Rear axle housing, l                                                 | 3.0                              |
| Steering gear case (for vehicles with power steering), l             | 0.55 – 0,6                       |
| Power steering system (for vehicles with power steering), l          | 1.3                              |
| Shock absorbers (each), l                                            | 0.265                            |
| Brake hydraulic drive system, l                                      | 0.67 “Sobol”<br>0.52 (“GAZelle”) |
| Clutch hydraulic drive system, l                                     | 0.2                              |
| Lubricant for front wheel hubs (both), g                             | 270                              |
| Lubricant for rear wheel hubs (both), g                              | 66                               |
| Windscreen washer tank, l                                            | 1,5                              |

<sup>1)</sup> For GAZ-560, 5601, 5602 vehicles.

<sup>2)</sup> For 4WD vehicles.

# CONTENTS

|                                                                                             | Page |
|---------------------------------------------------------------------------------------------|------|
| Introduction .....                                                                          | 3    |
| 1. Useful Hints .....                                                                       | 4    |
| 2. Vehicle Identification Data .....                                                        | 6    |
| 3. Specifications .....                                                                     | 10   |
| 4. Controls and Instruments .....                                                           | 27   |
| 5. Doors, Seats and Seat Belts .....                                                        | 38   |
| 6. GAZ-560, 5601, 5602 Engine Special Features .....                                        | 41   |
| 7. GAZ-32214 and GAZ-322174 Special Features .....                                          | 43   |
| 8. New Vehicle Running-in and its Operation .....                                           | 49   |
| 8.1. Engine Starting .....                                                                  | 49   |
| 8.2. Fuel-Air Mixture Preheating (ZMZ-4061, 4063 Engines) .....                             | 54   |
| 8.3. Oil Cooler Cock .....                                                                  | 54   |
| 8.4. Vehicle Driving .....                                                                  | 54   |
| 8.5. Braking .....                                                                          | 56   |
| 8.6. Heating and Ventilation of the Cab (Passenger Compartment) .....                       | 56   |
| 8.7. Headlamps .....                                                                        | 59   |
| 8.8. Fuses .....                                                                            | 60   |
| 8.9. Thermostarter Control Unit (Sofim 8140, 43C engine) .....                              | 63   |
| 8.10. Anti-lock Brake System .....                                                          | 63   |
| 9. Vehicle Maintenance .....                                                                | 65   |
| 9.1. Checking Engine Oil Level .....                                                        | 65   |
| 9.2. Checking Oil Level in Gearbox, Transfer Case (for 4WD Vehicles)<br>and Rear Axle ..... | 65   |
| 9.3. Checking Coolant Level .....                                                           | 66   |
| 9.4. Checking Brake Fluid Level in Brake Master Cylinder Tank .....                         | 66   |
| 9.5. Checking Brake Fluid Level in Clutch Master Cylinder Tank .....                        | 67   |
| 9.6. Checking Storage Battery Electrolyte Level .....                                       | 67   |
| 9.7. Checking Oil Level in Power Steering Reservoir .....                                   | 68   |
| 9.8. Engine Accessories Drive Belt Tensioning .....                                         | 69   |
| 9.9. Spark Plugs .....                                                                      | 70   |
| 9.10. Wheels and Tires .....                                                                | 70   |
| 9.11. Changing a Wheel .....                                                                | 71   |
| 9.12. Body (Cab) Care .....                                                                 | 73   |
| 9.13. Types of Maintenance .....                                                            | 74   |
| 9.14. Procedures carried out during Maintenance .....                                       | 74   |
| 9.14.1. Daily Maintenance .....                                                             | 74   |

|                                                                    | Page |
|--------------------------------------------------------------------|------|
| 9.14.2. Periodic Maintenance .....                                 | 75   |
| 9.14.3. Vehicle Lubrication .....                                  | 75   |
| 9.15. Oils, Lubricants and Special Fluids .....                    | 76   |
| 9.16. Equivalents of Fuels, Oils, Lubricants and Fluids .....      | 79   |
| 9.17. Parts to be Replaced on the Vehicle during Maintenance ..... | 81   |
| 10. Supplements .....                                              | 83   |
| 10.1. Electric Bulbs Used .....                                    | 83   |
| 10.2. Tightening Torque of Most Important Junctions .....          | 84   |
| 10.3. Filling capacities .....                                     | 86   |

Инструкция по эксплуатации автомобилей семейства  
«ГАЗель» и «Соболь» на английском языке.