

LIMITED LIABILITY COMPANY “KALANCHA”



ISO 9001:2015

**FIRE POWER PUMP
MP-20/100 “Geyser”
MP-20/100 P “Geyser”**

Technical Data Sheet
TECHNICAL DESCRIPTION
USER MANUAL
NP-20/100-00-00-00-00.PS



CITY OF SERGIEV POSAD

NACE: 28.13.14.190

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CITY OF SERGIEV POSAD

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VAZ 21114, operating in automatic mode. Supplement to section 5732

The present passport is for getting the basic information on the fire power pump, its structure, operating principles and set up as well as technical maintenance, probable failures and troubleshooting.

ATTENTION!

The manufacturer reserves the right to constantly improve the product configuration. The changes which do not influence the product operation, technical parameters and reliability may not be indicated in the present operating manual.

1. BASIC INFORMATION ON THE PRODUCT

The name and index:

- Fire power pump MP-20/100 “Geysler” with drive motor VAZ 21083 (VAZ 21114);
- Fire power pump MP-20/100 P “Geysler” with drive motor VAZ 21083 (VAZ 21114) on a trailer;

The numbers in the product name mean:

20 – rated flow rate, l/s;

100 – rated pump suction head, m;

P – modification on a trailer.

2. PRODUCT APPLICATION

The power pump is used for a flow of water and aqueous solution of foaming agents with a temperature of up to 30°C, the pH hydrogen exponent from 7 to 10,5, the density of up to 1100 kg/m³, the mass concentration of particulates of up to 0,5% with their max size of 3 mm during the fire-extinguishing.

The power pump can be used for pumping water from one reservoir into the other, for pumping water from wells, cellars, draining ponds, basins, for eliminating flooding of pits, cellars, buildings, for irrigation and watering, for preventing soil run-off, etc.

The power pump is designed according to GOST standard 15150-69 and is to be used at the outdoor temperature of -40°C to + 40°C.

In order to operate the pump at the temperature of lower than -40°C it is necessary to use anti-freeze and engine oils with the corresponding temperature parameters.

3. TECHNICAL SPECIFICATIONS

3.1. The specifications of the fire power pump are shown in Table 1.

Table 1

Name of characteristics	Values
Basic parameters	MP-20/100
Type of power pump	Mobile fire power pump
Rated flow rate Q_{nom} , l/min (l/s)	20
Rated pump suction head H_{nom} , m, minimum	100
Rated speed n_{nom} , rpm	3000
Rated geometric suction	
height $h_{g\ nom}$, m	3.5
Maximum geometric suction	
height $h_{g\ max}$, m	7.5
Flow at maximum geometric suction height Q , l/s,	
minimum	10
Pressure at maximum geometric suction height H , m	
Maximum inlet pressure, $p_{1\ max}$, MPa (kgf/cm ²)	80
Maximum outlet pressure, $p_{2\ max}$, MPa (kgf/cm ²)	
Dimensions, mm (max):	0,6 (6)
- length	
- width	1,5 (15)
- height	
Weight (dry), kg	1300
Number and nominal diameter of the connections, mm:	780
- suction	930
- pressure	215
Pump	1x100
Pump type	2x70
Vacuum system	
Type of vacuum pump	NP-20/100, centrifugal, console,
Maximum value of the created vacuum in the cavity	two-step
of the centrifugal pump, kgf/cm ²	automatic
	diaphragm
Suction (fill-in) time at max geometric suction height	
t_{st} , s, maximum	- 0,8
Engine	
	40

Type	4-stroke, gasoline, carbureted
Model	(injector)
Number and type of cylinders	VAZ 21083
Bore*stroke (mm)	(VAZ 21114)
Displacement, cm ³	
Compression	4 in a row
Max output at torque of 5500 rpm N _{ДВ} , kW (HP)	82x71
Starting system	1500
	9.9
Cooling system	
Fuel	55 (75) by electric kick
Fuel consumption g _f , l/h	Water-cooled (Tosol), forced gasoline 92 RON (92 RON for VAZ 21114) 8.6 (6.8 – VAZ 21114)

4. DELIVERY PACKAGE

Table 2

	Description	Qty.
MP-20/100 “Geyser”	The power pump	1
SV-100	Suction mesh	1*
	Reinforced suction hose assembled with a fire hose coupling head GRV-100	2*
	Pressure fire hose assembled with a fire hose nut GR-70 (diam.65 mm), operating pressure 1,6 MPa	2*
RS-70		1*
PS-1	Manual fire monitor	1*
GPS-600	Foam mixer	1*
	Foam generator	
SPTA		1 set
NP-20/100-00-00-00-00.PS	Spare parts and accessories	1
	Technical data sheet	1
	Search flashlight	2
	Impeller Assembly	

* At Buyer's request for an additional charge

Kitting list of SPTA

Table 3

Reference code	Description	Application	Qty.
Parts			
072-078-36	O-ring	pump	1
092-098-36	O-ring		1
235-245-46	O-ring		1
250-260-46	O-ring		1
030-035-30	O-ring		1
Work tools			
GOST 2839-80	Wrench 8×10	engine, pump	1
	Wrench 12×14		1
	Wrench 13×17		1
	Wrench 19×22		1
	Combined screwdriver		1
	Spark plug wrench		1
	Fuse		1
Accessories			
GOST 14286-69	Special wrench K-80	fire	1
	Special wrench K-150	valves	1

Note: A variation of a standard set and SPTA is allowed in coordination with the Consumer.

5. CONSTRUCTION AND PRINCIPLE OF OPERATION

5.1. Pump

Centrifugal pump NP-20/100 is installed on the power pump for water supply.

The pump is made two-step with axial supply of the first stage. As the diverter devices in the first stage, a guide device with transfer channels is used, and a guide device with an annular chamber is also used on the second.

The pump (Fig.1) consists of casing, cover, two impellers, shaft and seal assembly. The pump shaft is made of stainless steel and installed in the sliding maintenance-free bearing on the suction side and the intermediate bearing assembly.

Fire centrifugal pump NP 13/80.01

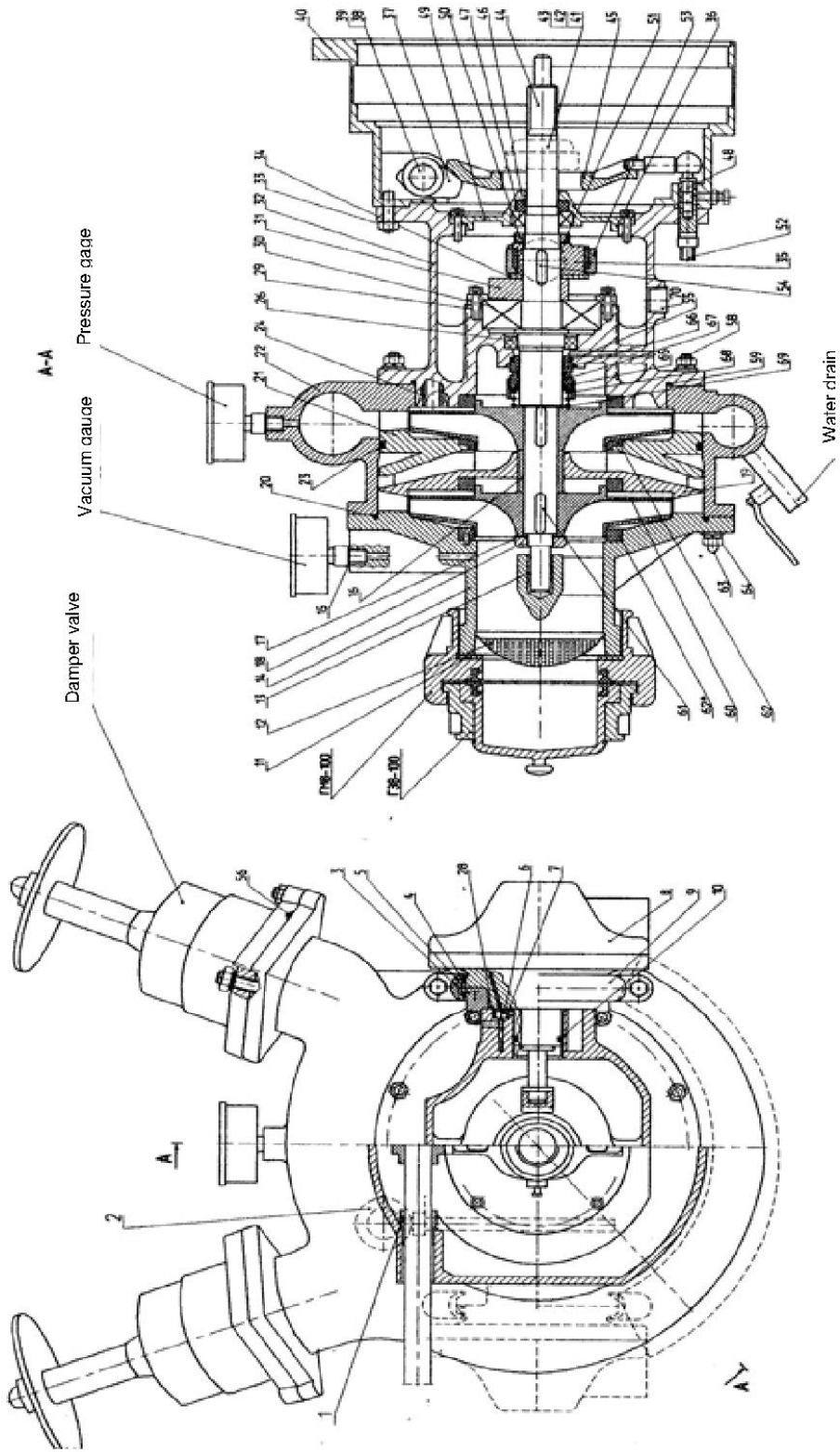


Figure 1

- | | | |
|-------------------------------------|---------------------------------------|--|
| 1. Ring NP 02.104 | 25. Cover NP 02.093 | 48. Axle NP 02.098 |
| 2. Oil gage | 26. Seal 1-35x55x10 | 49. Rib NP 02.096 |
| 3. Clamp 1 NP 02.050 (or NP 02.116) | 27. Seal casing | 50. Nut NP 02.111 |
| 4. Plunger 3m6x10 | 28. Ring 072-078-36 | 51. Lock washer 27.02.019 |
| 5. Lock ring NP 02.106 | 29. Rib NP 02.095 | 52. Set screw NP 02.097 |
| 6. Bushing NP 02.107 | 30. Ball bearing R6 406 | 53. Bearing (cage NP 02.112 and half NP 02.115) |
| 7. Cap NP 02.108 | 31. Bushing (counterweight) NP 02.087 | 54. Key 8x7x28 |
| 8. Diaphragm pump NP 02.020 | 32. Casing 2 NP 02.075 | 55. Ring 042-048-36 |
| 9. Clamp 2 NP 02.060 (or NP 02.117) | 33. Stud M8x25 | 56. Ring 092-098-36 |
| 10. Ring 030-035-30 | 34. Washer NP 02.088 | 57. Ring 105-110-30 |
| 11. Leather NP 02.102 | 35. Eccentric NP 02.089 | 58. Stud M8x25 |
| 12. Mesh NP 02.080 | 36. Ring 115-120-30 | 59. Ring 190-195-36 |
| 13. Starter bushing G24 | 37. Cam NP 02.101 | 60. Impeller NP 02.079 |
| 14. Cover NP 02.071 | 38. Clutch lever NP 02.030 | 61. Key 8x7x32 |
| 15. Leather NP 02.122 | 39. Axis NP 02.099 | 62. Angle ring NP 02.073 (62.*Ring NP 02.073-01) |
| 16. Spacer bushing NP 02.084 | 40. Casing 3 NP 02.076 | 63. Stud M8x30 |
| 17. Lock washer NP 02.085 | 41. Throw out collar NP 02.902 | 64. Nut M8 |
| 18. Impeller nut NP 02.086 | 42. Lock ring NP 02.901 | 65. Ring 032-038-36 |
| 19. Guide wheel 1 NP 02.081 | 43. Release bearing NP 02.903 | 66. Seal NP 02.033 |
| 20. Ring 250-260-46 | 44. Shaft NP 02.083 | 67. Seal NP 02.027 |
| 21. Guide wheel 2 NP 02.082 | 45. Lever bearing NP 02.040 | 68. Ring NP 02.028 |
| 22. Casing 1 NP 02.074 | 46. Seal 1-24x40x7 | 69. Spring NP 02.029 |
| 23. Ring 235-245-46 | 47. Bearing R6 105 | 70. Drain plug |
| 24. Bushing NP 02.109 | | |

Sealing of ball bearing units is provided by seals.

The impellers are mounted on the shaft on the dowels. Between the impellers located distance sleeve. There are holes in the rear impellers for unloading from axial force.

A probe is located in the pump housing to control the oil level.

The pump is equipped with a vacuum meter showing the vacuum in the suction nozzle and a pressure gauge showing the pressure at the pump outlet.

A drain valve is installed to drain water from the pump cavity.

The pump is equipped with two flow-regulating valves of disc type (Fig.2), a distinctive feature of which is that in the absence of pressure in the pressure pipe outlet is automatically blocked from the pump. Spring 3 presses the stock 4 with the valve 7.

5.2. Vacuum water filling system

The pump is equipped with automatic vacuum water-filling system “Primatic” (Fig.3). The diaphragm type vacuum pump is located directly in the centrifugal pump. When the centrifugal pump is switched on from the eccentric located on the shaft, the vacuum pump starts to work and the air is removed from the suction cavity.

Eccentric 1 moves the plunger 4 forward and backward through the pusher 2. During the suction, the plunger moves outward and the air from the centrifugal pump enters the chamber 9. Membrane 3 (Fig.3) covers the entrance to the chamber under the influence of spring 5 in the reverse movement of the plunger, and the air is vented to atmosphere through the holes in the plunger through the channel 6.

After filling the suction line and the pump, the pressure water enters the chambers 9 and overcomes the forces of the springs. Both plunger with a membrane 1 (Fig.7) and membrane 2 (Fig.8) takes the extreme position and block the entrance into the atmosphere. In this case both pushers come out of the eccentric working field.

Drainage holes are located on the body of the vacuum pump, they are allowed to leak water during the work of the pump.

Flow-regulating valve

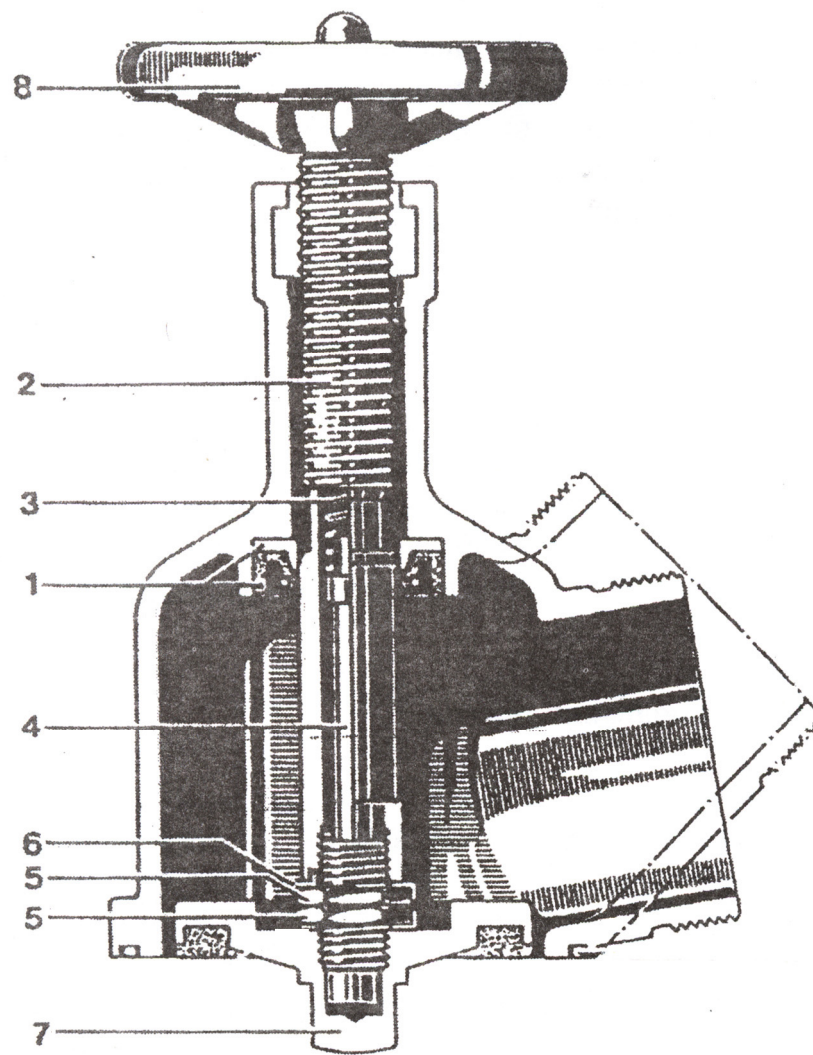


Fig.2

1. Rubber o-ring
2. Spindle shaft
3. Spring
4. Stock
5. Nut
6. Nut
7. Valve
8. Handwheel

Automatic vacuum
system "Pimatic"

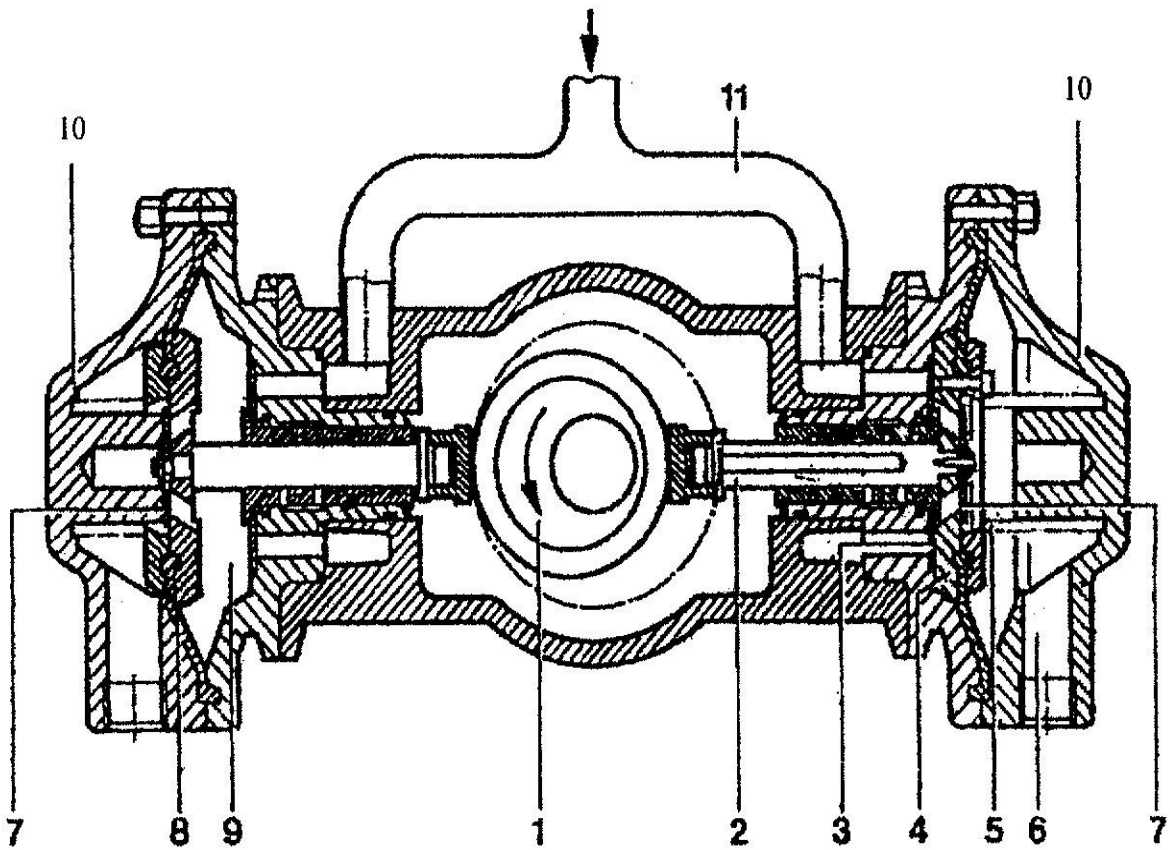


Fig.3

- 1. Eccentric
- 2. Pusher
- 3. Membrane 3
- 4. Plunger
- 5. Spring
- 6. Outlet

- 7. Membrane 1
- 8. Membrane 2
- 9. Case
- 10. Cover
- 11. Inlet

Diaphragm vacuum (membrane) pump

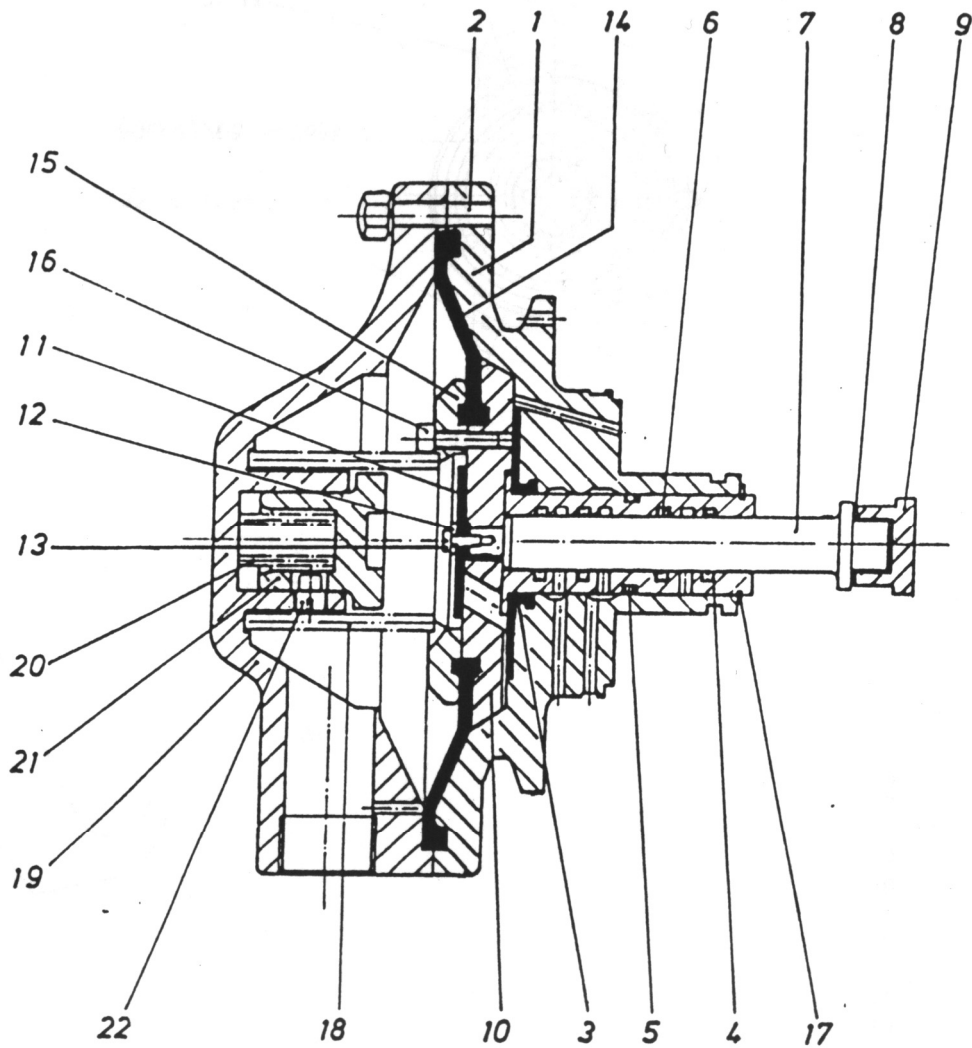


Fig.4

- | | |
|---|---|
| <ul style="list-style-type: none"> 1. Casing 2. Stud 3. Membrane 3 4. Bushing 5. Rubber o-ring 6. Rubber o-ring 7. Stock 8. Chip shield 9. Pusher 10. Plunger 11. Membrane 1 12. Washer | <ul style="list-style-type: none"> 13. Helix 14. Membrane 2 15. Washer 16. Helix 17. Washer 18. Spring 19. Cover 20. Spring 21. Counter piston 22. Bolt |
|---|---|

5.3. Control system, instrumentation equipment

The power pump controls are located on the dashboard (Fig.5) attached to the frame.

The control system consists of the following elements:

- clutch on / off handle (5);
- ignition on / off key (3);
- starter on button (4);
- carburetor air flap control knob (8) (missing on VAZ 21114);
- carburetor throttle control knob (9).

To turn on the clutch you have to put the lever in “1” position, to turn off - in position “0”.

The operation of the carburetor knob control is connected with the rods of the air and throttle valves by means of rigid wires in a protective braids.

When operating the power pump, it is necessary to ensure that all the traction control systems are properly adjusted.

The following instrumentation are used to control the operation of the engine and pump (Fig.5):

- warning light for ignition and charging the battery pack (1);
- warning light for the oil pressure in the engine lubrication system (2);
- warning lamp for overheating the coolant in the engine cooling system (7);
- hour counter (10);
- warning lamp for overheating the coolant in the engine cooling system (7);
- warning lamp for normal temperature of the engine coolant (11).

The block diagram is presented in Fig.6.

A vacuum meter is installed directly on the pump to measure the vacuum at the inlet of the pump and a pressure gauge to measure the pressure at the outlet of the pump.

5.4. Frame

The centrifugal pump and engine are mounted on a special welded frame made of steel pipe. The frame is equipped with four folding handles for carrying a power pump.

Power pump is equipped with a protective casing to protect it against mechanical damage and precipitation.

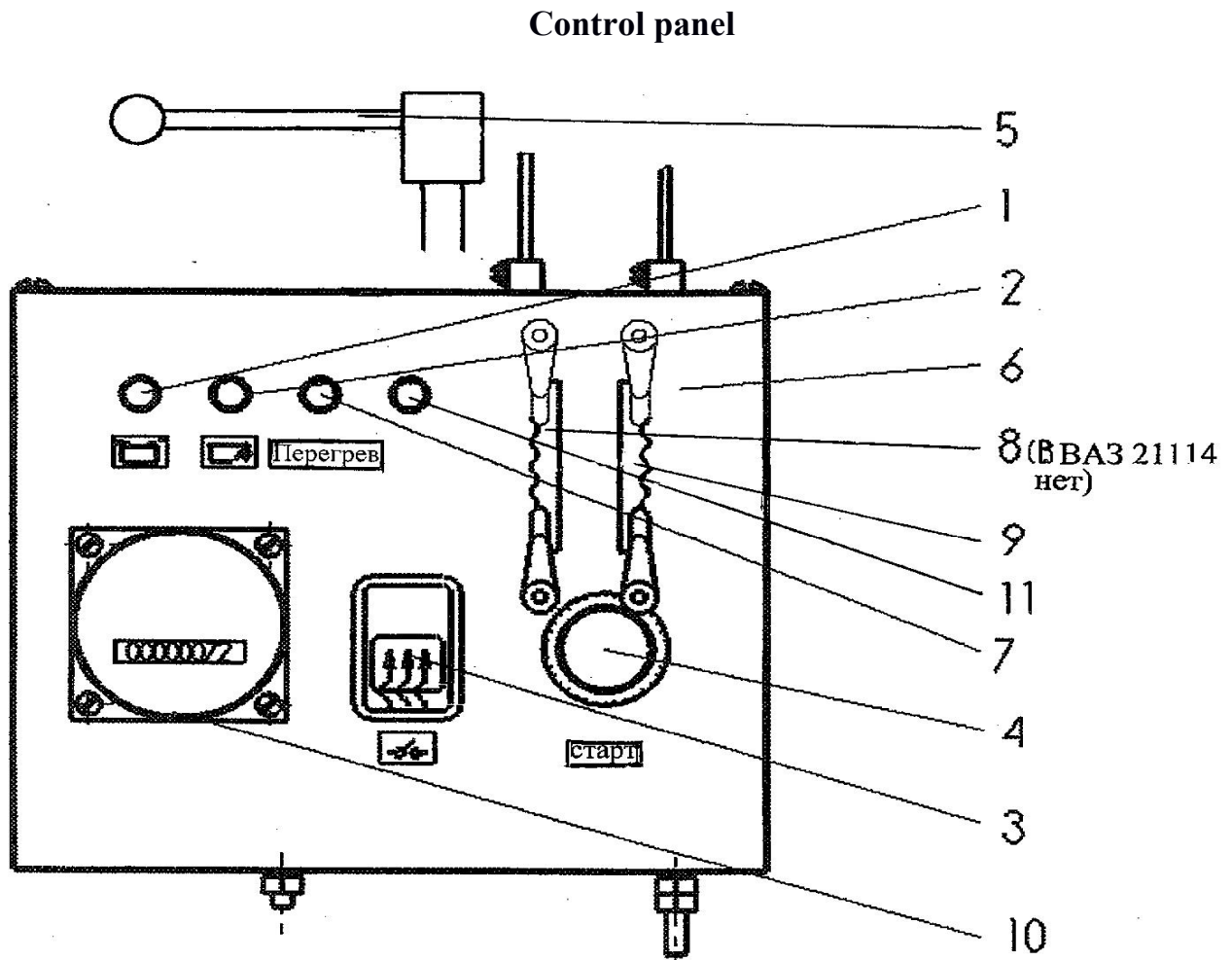


Fig.5

1. The warning lamp for the battery charging.
2. Control lamp for oil pressure.
3. Ignition on / off key.
4. The "Start" button.
5. Clutch handle.
6. Control panel.
7. A warning lamp indicating an excess of temperature in the engine cooling system.
8. Air flap handle (not available on the remote control with engine VAZ 21114).
9. Throttle knob.
10. Service hour meter.
11. Warning lamp for normal temperature of the engine coolant.

ATTENTION!

The engine turns off automatically when the red light on the control panel lights up. This occurs when the temperature rises above 93⁰ C in the engine cooling system. This function is intended to prevent the engine from overheating. Re-start the engine after 20 to 30 minutes.

Block diagram

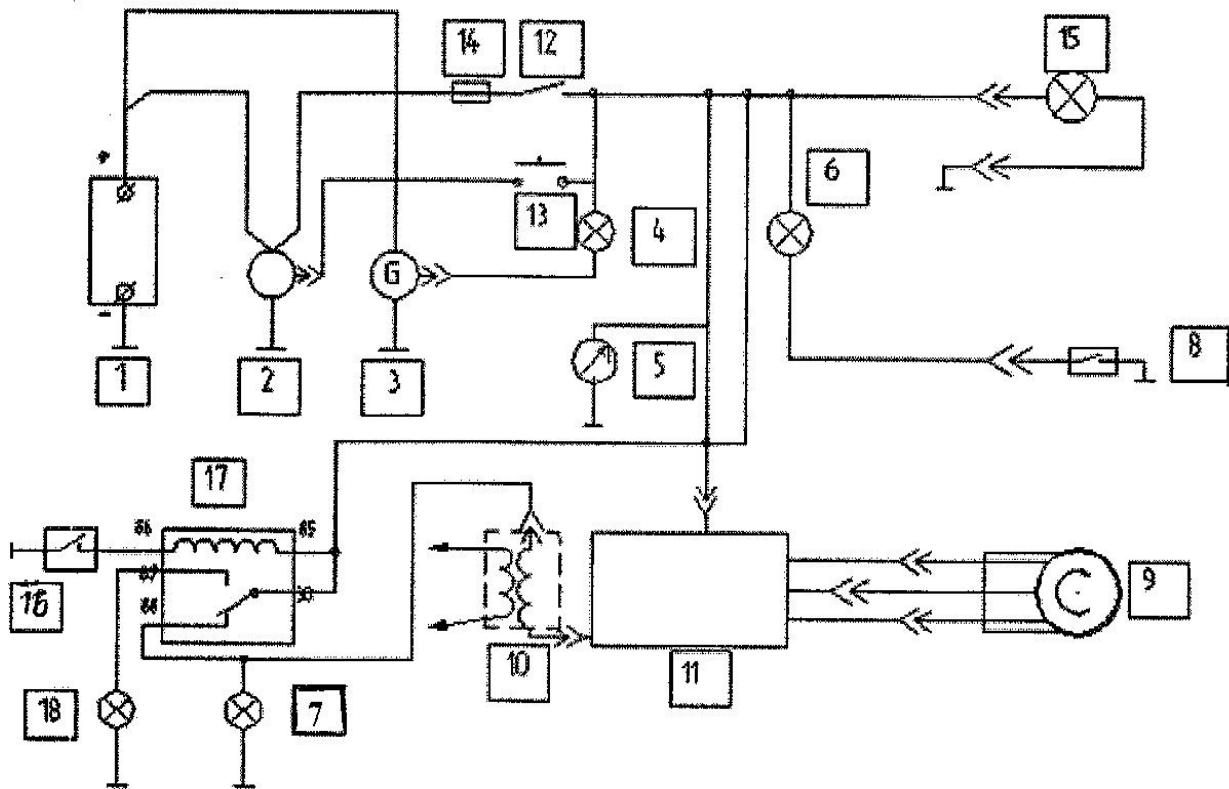


Fig.6

1. Accumulator bench
2. Starter;
3. Generator;
4. The warning lamp for the battery charging.
5. Service hour meter;
6. Control lamp for oil pressure;
7. The indicator lamp "Operating";
8. Pressure gauge;
9. A torque sensor of a sparking;
10. Transformer;
11. Switch;
12. Ignition switch;
13. Starter button;
14. Safety device;
15. Search flashlight
16. Overheat sensor;
17. Relay 75.3777;
18. Warning lamp for overheating.

5.5. Engine

The power pump is equipped with a serial gasoline carburetor engine VAZ 21083 or injection VAZ 21114 .

A detailed description of the design of the engine, its operation, maintenance and repair is included at the request of the customer.

5.6. Engine cooling system

The engine cooling system is liquid, closed with forced circulation and expansion tank.

The cooling system uses a radiator of special design. The system is filled with coolant brand "Tosol A-40".

* An additional radiator can be installed on the power pump, which provides additional cooling in the hot season, increases the time of operation before overheating protection system activates, reduces the cooling time of the power pump engine after shutdown at overheating.

5.7. Fuel tank

Fuel tank is a standard 20L canister with a tube with a connection for the fuel hose. The tank is installed in a special recess on the frame of the power pump.

* Installation of fuel tanks up to a volume of 42л according to customer's requirement.

5.8. Accumulator bench

The power pump is equipped with accumulator bench with capacity of 45 AHr.

5.9. Search flashlight

The power pump is equipped with a search, hinge, removable halogen flashlight with a 55 W incandescent lamp. The flashlight is mounted on the pump frame.

6. SAFETY MEASURES

Only persons who have studied the apparatus and the rules of operation of the power pump are allowed to work with it.

Operation of the pump must be carried out only outdoors. The operator's workplace must be windward.

Refueling is carried out only when the engine is switched off! When refueling, keep in readiness the fire extinguisher OP-5 or OU-5!

It is forbidden to connect and disconnect sleeves, pipelines, to tighten threaded connections during operation of the power pump.

The power pump during operation should be installed horizontally on a hard surface. A slope of more than 10° is not allowed when installed on the ground.

The minimum water pressure at the outlet (see pressure gauge) should be at least 1.5 kg/cm² while the pump is on.

ATTENTION! Do not operate the pump for more than 1 minute (dry vacuum test) with the pump turned on in dry mode (without water) and the outlet pressure is greater than 1.5 ATM, it can damage the pump!

It is not allowed to leak fuel from the fuel tank, gas pipeline and float chamber of the gasoline pump carburetor during operation.

Strongly prohibited!

- smoking and making of an open torch near the power pump!

- operation of the power pump at the open energized power lines located in a radius of action of a jet of the hand-held branch;

- operation of the pump in deep wells, mines and in non-ventilated areas;

In the event of an accident, stop the engine immediately by turning off the ignition.

7. MAKE READY

The durability of the engine and the pump as a whole largely depend on the mode of its operation during the run-in.

The duration of running-in is 30 hours

Before the first start:

- check the level and the presence of oil in the crankcase of the engine and the pump;

- check the electrolyte level in the battery cells and if necessary top up with distilled water (the electrolyte);

- check the coolant level (Tosol A40) and refill if necessary.

Carefully inspect the entire pump.

Swap gasoline to the carburetor from the fuel tank using the manual drive of a gasoline pump. In the engine pump VAZ 21114 gasoline is pumped automatically, turn on the ignition and wait for 5-7 seconds.

Start the engine, heat it to a temperature of 60 - 70°C and check if there is any leakage of oil, coolant or petrol.

7.1. Engine running-in

Make running-in of the engine as listed in table 4:

Table 4

The pressure at the pump outlet, P_2 , kgf/cm ²	Pump flow, Q , l/s	Duration, t, hours
3 - 4	3 - 6	10
5 - 6	3 - 6	10
6 - 8	6 - 8	5
6 - 8	8 - 10	5

After running-in:

- replace the oil in the engine;

- replace the oil filter;

- adjust the idling speed of the engine;

- check the mounting of the alternator, battery, radiator, engine mounting, exhaust system, clutch housing to the engine;

- adjust the fan belt tension, if necessary.

8. MODE OF OPERATION

8.1. Operation with open water sources (made by trained personnel)

Install the power pump on a flat ground.

Remove the plug from the suction pipe of the pump. Connect the suction hoses and attach them to the suction mesh SM-100. Connect one end of the hose to the pump, and lower the other end with the mesh into the pond. The mesh shall be submerged in water to a depth of not less than 0.5 m. When laying the suction line should not have kinks in the vertical plane, as this can lead to the formation of “air bags” and unstable operation of the pump.

Remove the plugs from the discharge valves of the pump and connect the pressure hose with **the trunks** to the discharge valves.

Check the closing of the drain valve.

Turn off the clutch (move the clutch knob to position "0" smoothly).

Close the air flap (move the carburetor air flap control knob to the top position). (There is no handle choke control on the power pump with the engine VAZ 21114).

Turn on the ignition key, the battery charging indicator lamp and the oil pressure lamp should light up. (The fuel pump would start working on the power pump with the engine VAZ 21114. Press the starter switch button in 5-7 seconds)

Press the starter switch (10 seconds max). If the engine will not start, turn the ignition off and restart engine after 10-15 seconds. The battery charging and oil pressure indicator lights shall be switched off when the engine is running.

After starting the engine, heat it to a temperature of 40-50 °C and turn on the clutch: gradually move the clutch knob to position "1".

When the clutch is switched on, a centrifugal pump and a vacuum water filling system start to operate.

After filling the suction line and the pump with water (the pressure at the pump outlet of 1.5-2 kgf/cm²), the vacuum system shall shut off automatically.

Raise the pressure at the pump outlet to 5-6 kgf/cm² using the carburetor throttle control knob, and open the pressure valves smoothly.

When the engine temperature reaches 70-80⁰ C, open the carburetor air flap (move the control knob to the lower position). The handle of the air flap control is not available in the motor pump with the engine VAZ 21114.

It is recommended to maintain the coolant temperature within 85-90 °C (automatically).

The operating mode of the pump is regulated by the throttle control knob (pressure at the pump outlet) and pressure fans (pump supply).

After the end of the work, smoothly reduce the engine speed, while reducing the pressure at the pump outlet. When reaching a pressure of 2-3 kgf/cm² switch off the clutch (install the clutch handle in the “0” position) and turn the control knob to the throttle valve of the carburetor to the lower position.

If the pump has been running on contaminated or salty water, rinse it with clean fresh water!

Operating from hydrant:

Fix the power pump on a flat ground (the slope during installation should not exceed 10°) in a convenient position in relation to the hydrant.

Attach suction and pressure hoses. Open the hydrant valve and drain contaminated water until clean water is available. Attach the second end of the suction hose to the hydrant. Open the hydrant valve. Check the closing of the drain valve. Turn off the clutch. Then proceed as described when operating from open water sources.

When operating under low temperature conditions, the following requirements must be met:

- the power pump should be dry before the first start;**
- use the appropriate coolant.**

Drain the remaining water from the pump with a tap (Fig.1) after working in sub-zero temperatures. Switch off the ignition key after the engine is idle for a short time.

8.2. Maintenance of the pump during operation (performed by trained personnel)

Visual control of the following elements is required when the power pump is running:

- pump outlet pressure,
- engine oil pressure (by indicator lamp).
- performance of the engine generator (control lamp);

Ensure the suction mesh is immersed in water to a depth of not less than 0,5 m. in order to avoid the ingress of air into the suction line when working from the pond.

If the power pump is running for a long time under high temperature, remove the protective cover after stopping the engine.

8.3. Maintenance of the pump after operation (performed by trained personnel regularly after each application)

After operation:

- 8.3.1 - disconnect the suction hose;**
- 8.3.2 - open the drain tap on the pump;**
- 8.3.3 - place the plug on the suction nozzle of the pump;**
- 8.3.4 - disconnect the pressure hoses and drain the water from them;**
- 8.3.5 - install plugs on the pressure valves of the pump;**
- 8.3.6 - start the motor pump with the pump turned on 2-3 times for 5-7 seconds-this is necessary for squeezing water from the cavity of the suction pumps and the pressure pump (especially in the cold season);**
- 8.3.7 - dry suction and pressure hoses;**
- 8.3.8 - check the coolant level and oil level in the engine and pump;**
- 8.3.9 - thoroughly clean all equipment and the power pump both inside and outside from dirt and dust;**
- 8.3.10 - carefully inspect all piping, engine mounts and pump attachment, individual components of the engine. Tighten the loose joints, if necessary.**
- 8.3.11 - check the welds of the frame visually;**
- 8.3.12 - eliminate all defects seen during operation.**

Following logs must be kept during operation:

- a log of operating time of the power pump;
- a log of faults in the operation;
- a log of the technical condition;
- a log of maintenance.

The logs should also contain information about changes in the design of the product and its components made during operation and repair, information about the replacement of the components of the product during operation, information about the repair of the product.

9. TECHNICAL maintenance (maintenance, repairs and inspections are made only by trained personnel!)

9.1. Trouble-free operation of the power pump depends on proper and timely maintenance.

9.2. Maintenance of a power pump consists of periodic check of the condition of units and mechanisms, carrying out necessary repair work, adjustment and oiling.

9.3. Maintenance of the power pump in the scope of work and frequency of meetings is divided into three types:

- every shift maintenance (table 5);
- maintenance no.1 (TO-1), held after 100 hours of operation of the power pump (table 6);
- maintenance no.2 (TO-2), held after 200 hours of operation of the power pump (table 7);

When storing the power pump in the warehouse for more than 3 months, it is necessary to make every-shift maintenance (table 5).

9.4. Every shift maintenance

Table 5

Content of works and methods of their performing	Specifications	Devices, tools, devices and materials needed to perform the work
Inspect the installation site of the pump and make sure there is no leaking oil, fuel and coolant. Clean the power pump from dirt and dust. Clean up used hardware. Check engine and pump oil level, coolant level	Leaking of oil and fuel and coolant is not allowed. The oil level should be on	Visually Rags, water, gasoline

Check the density and reliability of the wires attached to the battery terminals Check and, if necessary, adjust the tension of the alternator belt	the upper label of the probe. The coolant level should be marked " max " in the expansion tank	Probe Visually
Check the smoothness of movement of the carburetor flap control knob	Slippage of the belt is not allowed	SPTA keys SPTA keys
Start the power pump for 5-7 seconds with the pump on	No signs of sticking are allowed	

9.5. Maintenance No. 1

Table 6

Content of works and methods of their performing	Specifications	Devices, tools, and materials needed to perform the work
Perform maintenance work on a shift basis		
Check that the starter and alternator are securely attached to the engine	Loosening of fastening is not allowed	SPTA keys
Check the installation of the fuel pump	There should be no leaks at the connections	SPTA keys
Listen to the engine valves and adjust the clearances if necessary	There must be no knocking and rattling valves	SPTA keys
Clean the battery terminals and wire terminals.	Dirt, oxidation is not allowed	Rags, technical petrolatum
Check the electrolyte level in the battery banks and the degree of	According to the	SPTA keys Distilled water, electrolyte, load

charging	instruction manual of the battery	plug
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9.6. Maintenance No. 2

Table 7

Content of works and methods of their performing	Specifications	Devices, tools, and materials needed to perform the work
Perform maintenance No. 1		
Replace the filter and oil in the engine	According to the instruction manual of the engine	Strain. SPTA keys
Replace the oil in the pump	See Fig.1 - Unscrew the plug (ref.70), drain the oil and screw the cap back on. Fill the oil to the mark on the probe through the probe channel (ref.2)	Oil. SPTA keys
Rinse the cooling system and replace coolant	According to the instruction manual of the engine	Tosol. SPTA keys

10. PROBABLE MALFUNCTION AND TROUBLESHOOTING

Table 8

Name of malfunction, external manifestation and additional signs	Probable cause	Troubleshooting
<p>Malfunction of the engine and its units (see "Manual on maintenance and repair of cars VAZ 21083 and VAZ 21114")</p> <p>The vacuum system does not fill the suction line and the pump with water</p>	<p>1. The drain valve is open 2. The suction line is not hermetic</p> <p>3. Suction mesh is not fully immersed in water 4. Vacuum pump membranes are dirty</p>	<p>1. Close the valve 2. Check availability of packing seals in the coupling head. Check the condition of the suction hoses, if punctures or breaks are found, replace them with new ones 3. Load the mesh to a depth of not less than 0.5 m 4. Clean membranes, inspect and replace them, if necessary</p> <p>1. Clean the suction mesh and filter 2. Replace the faulty hoses</p>
<p>Vacuum pump works, the vacuum is normal, the water does not enter the pump</p>	<p>1. Clogged suction mesh or filter at the inlet of the pump 2. Stratification of suction hoses</p>	<p>Load the mesh to a depth</p> <p>1. Clean the suction mesh and filter 2. Reduce pump flow</p>
<p>When the pump is operated, the vacuum pump is frequently switched on and off</p>	<p>Failure of the head as a result of insufficient penetration of the suction mesh</p>	<p>1. Tighten the bolts</p>
<p>When the pump is running, the</p>	<p>1. Clogged suction mesh or filter at the inlet of the</p>	<p>2. Replace the</p>

flow has decreased, the pressure gauge arrow fluctuates greatly	pump 2. The pump flow exceeds the permissible value for the height of the suction	bearings 3. Replace impellers 4. Remove extra objects
During the operation of the pump, knocks and vibration are observed	1. The pump mounting bolts are loosened 2. Bearings are worn 3. The impellers are damaged 4. Extra items entered	Replace the seal Purge the refrigerator of compressed air
Water flows from the drain hole with a stream	Violation of tightness of the mechanical seal	
The engine overheats when the pump is running	There was a blockage of the refrigerator	

11. STORAGE, PRESERVATION AND DELIVERY POLICY

The power pump should be stored in closed heated room at a temperature not exceeding +40 °C.

A power pump, spare parts and tool should be prepared for putting in prolonged storage. Putting in prolonged storage should be carried out indoors at a temperature not lower than + 15 °C.

For this you need:

- to wipe with a cloth dampened in gasoline, all parts and assemblies;
- to clean, rinse and dry parts and components that have traces of corrosion;
- to put the plugs on the suction and pressure pipes;
- to start the engine and warm it up, stop the engine, drain the gasoline from the fuel tank;
- to start the engine again and run in idle mode until full fuel consumption from the carburetor (not valid on the engine VAZ 21114);
- to remove the spark plugs and pour into each cylinder 25-30 g of engine oil. Turn the crankshaft for 2-3 times and wrap the candles for an even distribution of the oil;
- to clean up all the wiring and wipe dry;

- to lubricate all unpainted metal part of the pumps the oil preservative NG-208 or technical petrolatum VTV-1;

- to remove the battery and grease the terminals with petrolatum.

It is necessary to check the condition of the power pump at least once every three months.

The power pump can be transported by all means of transport.

Oil TAD-17 (or his substitute) is used in the pump, oil M-63/12P GOST 10541-78 (or his substitute) is used in the engine.

Use the engine oil SAE-5W-40 at temperatures below-20⁰C.

Replacement of oil in the engine, pump, coolant in the cooling system, oil filter after running-in and during operation **during the warranty period** is carried out at the expense of the organization operating the power pump.

Oil, coolant (Tosol-antifreeze) should be replaced after 30-40 hours of operation.

The following filters are used:

- air filter M-2141-110980-02;
- fuel filter 2101-099 Volga 17.193.1117010;
- oil filter 2105

The manufacturer reserves the right to constantly improve the product configuration in case there is no damage effect on the main characteristics of the product.

Periodic verification of the pressure gauge and the vacuum meter is produced by the organization that operates the power pump.

ATTENTION!

The pressure gauge and vacuum meter are filled with silicone oil. It is strictly forbidden to drain it from the casing.

12. CERTIFICATE OF ACCEPTANCE

FIRE POWER PUMP MP-20/100 "Geyser" serial No. _____

engine VAZ 21083 No. _____

engine VAZ 21114 No. _____

centrifugal pump NP-20/100 No. _____

meets the requirements of 4854-001-18215408-99 PC (as amended)

Operating is made in full according to the 4854-001-18215408-99 PC (as amended)

Operating time counter readings _____, h

Stamp here

Production date

Chief of QCD _____

Source inspector _____

OOO "Kalanča"

141313, 22/1 Zheleznodorozhnaya st., Sergiev Posad, Moscow region, Russia.

E-mail: kalanča@kalanča.ru

Tel./fax +7 495 781-92-48.

13. GUARANTEE OBLIGATIONS

The service life of the power pump is 10 years.

The manufacturer guarantees the correct operation of the power pump within 300 hours from the date of its commissioning, but not more than 12 months from the date of shipment to the consumer, subject to the rules of operation and storage specified in the passport.

The manufacturer is obliged at its own expense and as soon as technically possible to restore the performance of the motor pump in case of failure of individual parts or the power pump during the warranty period.

The warranty period of components is considered equal to the warranty period of the power pump and expires simultaneously with the expiration of the warranty period of the power pump.

The warranty will not apply to the pumps used for competition and training, disassembled for repair without agreement with the manufacturer, as well as with traces of mechanical damage, changing the design of individual components and without the presence of the seals of the manufacturer.

Warranty obligations of the manufacturer can be changed in accordance with the terms of the the supply contract. They must be stated in the warranty card in this case.

14. INFO ON RECLAMATION

The reclamation report is made by the consumer during the warranty period together with the representative of the manufacturer; in case of absence within the prescribed time - with a representative of another uninterested organization.

The following information should be provided in the report:

- time and place of drawing up the report;
- last names and job titles of the persons which made the report;
- exact both postal and railway addresses of the consumer;
- sort, serial number of the power pump and receipt date;
- the total operating time of the pump (in hours) from the moment of its purchase and separately - since the last repair; conditions of operation or storage;
- the readings during operation;
- a detailed description of the malfunctions or apparent defects that have arisen, indicating, where possible, the causes of the defects;
- repairs made by the consumer before the reclamation.

The card of revision of the power pump is sent together with the act if the consumer made repair of the power pump.

At the request of the manufacturer the power pump must be sent to its address with the passport and the reclamation.

The visit of the representative of the manufacturing enterprise for carrying out warranty repair of a power pump at the consumer is performed according to terms of the contract.

15. EXPERIENCE WITH A PRODUCT

FIRE POWER PUMP MP-20/100 “Geysler”

Serial No. _____ Production date _____

2. Nature of use of a power pump _____

3. How many hours have the product worked since the beginning of operation or after the last recall _____

4. What shortcomings were identified in the design of motor pumps and what measures have been taken to eliminate them _____

5. What types of maintenance and in what quantity have been carried out _____

6. How many times and what kinds of repairs the product has been subjected _____

7. Which parts of the product were replaced during operation _____

8. What changes in the design of the product and its components were made during operation and repair _____

9. Your wishes for further improvement of product quality_____

10. Your mailing address _____

11. Job title, full name (and signature) of the person who made the review_____

Date of completion_____

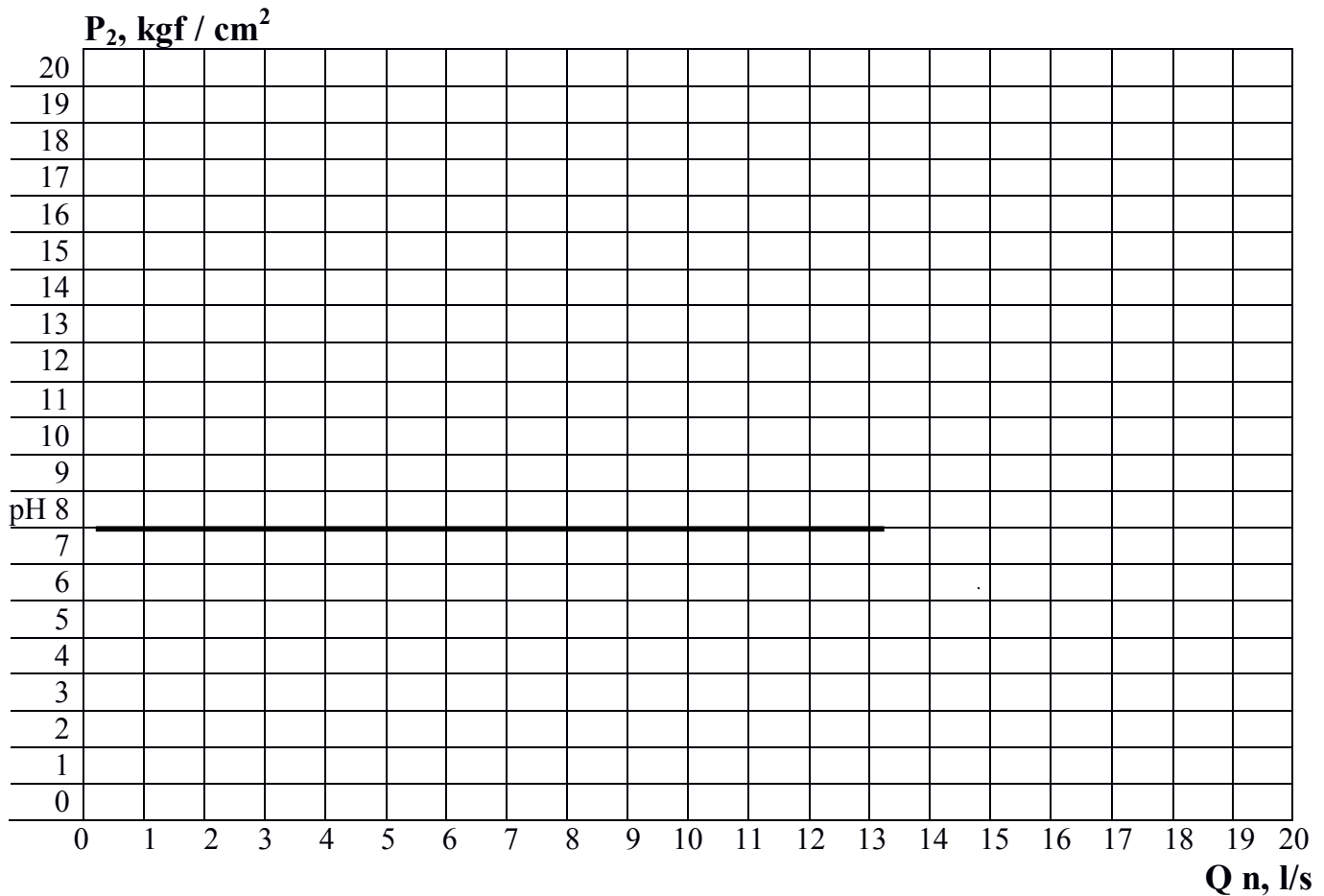
Send your feedback to the address: 141313, 22/1 Zheleznodorozhnaya st.,
Sergiev Posad, Moscow region, Russia.
Tel./fax +7 495 781-92-48.

E-mail: kalancha@kalancha.ru

Notes:

1. Indicators for each withdrawal point are given for the period according to the number of hours worked.
2. When filling in paragraphs 3 to 7, the number of hours of work should be indicated.
3. Feedback should be sent to the manufacturer at least once a year.

Flow characteristics of the water pumps MP-20/100



..... - Operating characteristics of MP 20/100 (VAZ 21114)
 ——— - Operating characteristics of MP 20/100 (VAZ 2108)

Table of characteristics
MP 20/100 (VAZ 2108)

Table of characteristics
MP 20/100 (VAZ 21114)

No.	P2, kgf / cm ²	Q, l/s
1	19.0	0
2	15.0	11.0
3	14.0	13.0
4	13.0	14.5
5	12.0	15.7
6	11.0	16.8
7	10.0	17.7
8	9.0	18.3
9	8.0	19.0
10	7.0	19.5

No.	P2, kgf / cm ²	Q, l/s
1	19.0	0
2	15.0	14.0
3	14.0	16.0
4	13.0	17.0
5	12.0	18.3
6	11.0	19.3
7	10.0	20.0
8	9.0	23.0
9	8.0	25.0

11	6.0	20.0

Annex 2.

The power pump MP 20/100 with VAZ 21114 engine, operating in automatic mode - automatic pumping station (hereinafter - APS).

ATTENTION! Pressure valves must be open!

The signal "Fire" from the sensor turns the starter and starts the engine (the sensor sends a signal to the starter until the engine starts). The starter switches off automatically after starting the engine.

The engine runs at idle until the pump pressure rises to 2 Kgs/cm². Throttle valve opens automatically, engine speed increases to " max " and the APS goes to the maximum water pumping mode.

Two options for the operation of the APS are proposed:

1. There is a connector for water sensor - ref.5. The user installs the sensor into the water tank and connects it to the connector (ref.5) on the back of the control panel. The sensor indicates the absence of water, which enables the idle mode of the APS. To stop the APS, press the "Ready" button - the "Ready" lamp lights up and the APS enters the standby mode. The APS is ready to work.

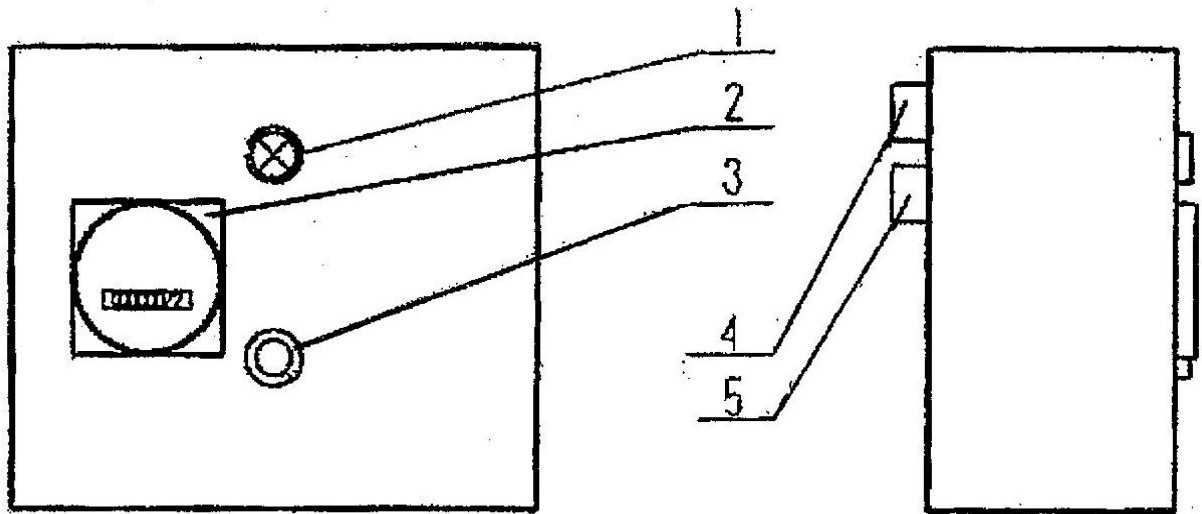
2. The manufacturer installs the jumper in the water sensor connector (ref.5). At the end of the water in the tank pump pressure drops and the engine goes into idle mode. To switch off the motor and set the APS to standby mode, remove the jumper from the connector and press the "Ready" button, put the jumper in the connector - the lamp "Ready" lights up and the APS enters the standby mode. The APS is ready to work.

If the water sensor is installed in the tank, the APS engine will not start in the absence of water.

If there is a jumper in the connector, the APS engine will start and will operate in idle mode.

The engine of the APS will not start at a low level of gasoline in the tank.

APS control panel



1. Lamp "Ready".
2. Service hour meter.
3. Button "Ready".
4. Connector for interfacing with the connector of the common cable harness.
5. Connector "Water".