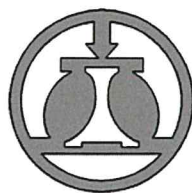


INNOVATION AND INTRODUCTION ENTERPRISE of E. DERGACHEV, OOO
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**UNIVERSAL
CUTOUT VALVE**

Operations manual

HT-0301/5.1.1M PЭ
(for railway car model 61-4514)

Chief designer, OOO IVP-ED

/ **Signature** / **A.N. Kuznetsov**

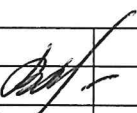
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HT-0301/5.1.1MPЭ

Universal cutout
valve

Operations manual

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ООО IVP – ED		

This operating manual (OM) is intended for the study of the Universal cutout valve dwg K-0301.00.00.000/5.1.1M (hereinafter the Valve, dwg K-0301/5.1.1M) designed and manufactured by OOO IVP-ED. The manual provides basic information about the device, its operation and installation into the water supply tank of the passenger car, model 61-4514 (hereinafter the Tank), the circuit of which has a removable distribution battery. The valve is a precise hydraulic device, its installation should be performed in strict accordance with this OM by trained specialists.

The valve is designed in accordance with TU 318380-004-11473078-04.

The valve is protected by patent of the Russian Federation:

- No. 2376179 of 30.01.08 (international patenting PCT/RU2008/000604)

1 Description and operation

1.1 Valve intended purpose

The valve is designed to cut off the water feed to the tank after filling it up with water, followed by signaling the end of filling.

1.2 Technical characteristics

Technical specifications	Dwg K-0301/5.1.1M
Overall dimensions:	
• height, mm (with adapting pipes)	273
• height, mm (without adapting pipes)	199
• diameter, mm	106
Weight, kg	2.2
Maximum water pressure in the filling line, MPa	0.8 (8 atm)
Probability of failure-free operation [P(t)] within 5 years	0.995
Fed fluid	potable water
Operating conditions	NF, cat. 5 GOST 15150-69

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1.3 Structure and function

1.3.1. The valve dwg K-0301/5.1.1M (Fig.1) includes a float shut-off device (Tag No. 3) (hereinafter FSD), a T-connector (Tag No. 1), two fittings (Tag No. 15) with spring-loaded check valves (Tag No. 17) and an adapting pipe (Tag No. 2).

The valve is attached to two water-filling pipes (Tag No. 14) via a tee (Tag No. 1) and two fittings (Tag No. 15). The valve is attached to the distribution collector using a hexagon socket head cap screw (Tag No. 18) and a bridge (Tag No. 28) welded to the adapting pipes (Tag No. 20). Inside the two fittings (Tag No. 15) there are spring-loaded check valves (Tag No. 17), each of which can be in an open or closed position, depending on which side railway car is refilled with water.

Operation of the valve dwg K-0301/5.1.1M includes the following: the water from the pressure line enters the tank through the water-filling pipe (Tag No. 14), check valve (Tag No. 17) of the fitting (Tag No. 15), the T-connector (Tag No. 1), adapting pipe (Tag No. 2) and FSD (Tag No. 3). After filling the tank with water the float (Tag No. 4), through the bracket (Tag No. 8), the rod (Tag No. 9) activates the FSD (Tag No. 3) that shuts off the water supply to the tank. At the same time, the water begins to flow through the signal tube (Tag No. 11) into the overflow pipe (Tag No. 12), signaling the end of filling. After closing the pressure line valve or disconnecting the filling hose all the elements of the valve reposition.

ATTENTION!

The alarm system operates at a pressure in the pressure line of minimum 0.1 MPa $\pm 10\%$

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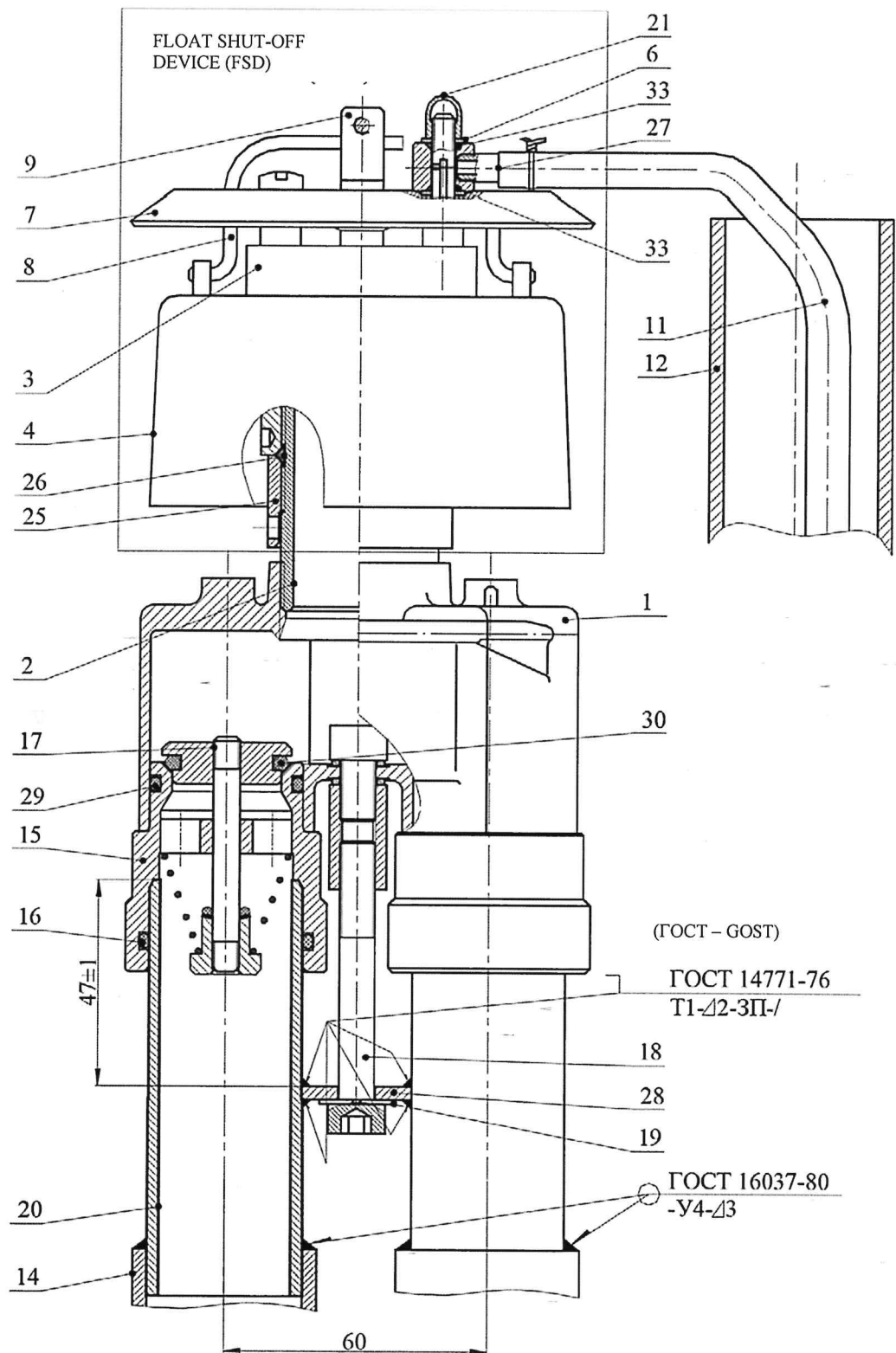


Fig. 1 – Structure and function of the valve.

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1.4 Delivery set

The delivery set for one car includes:

- FSD and T-connector assembled K-0301/5.1.1MO - 1 piece
- Bridge K-0301.00.00.033/4 - 1 piece
- Hexagon socket head cap screw GOST R ISO 4762 - M8x60-A2-70
(replacement is allowed: Hexagon socket head cap screw DIN 912 - M8x60-A2-70) - 1 piece
- Washer (spring) 8.3X13 GOST 6402-70 - 1 piece
- Adapting pipe K-0116.00.00.001 - 2 pcs.
- Filter K-0212.00.00.000CB - 2 pcs.

- Product certificate HT-0301/5.1.1M IIC - 1 piece per batch
- This operating manual PЭ-0301/5.1.1M PЭ - 1 piece per car

Example of an order entry:

Universal cutout valve dwg K-0301.00.00.000/5.1.1M

2 Installation instructions

This installation manual contains the information necessary for the correct installation of the valve into the tank.

When installing the valve into the tank, also follow the documentation given below:

- Passenger cars. Maintenance and current repair manual. JIB1.0005 PЭ
- Passenger cars. Roundhouse servicing manual JIB1.0027 CO
- Passenger cars. Overall repair manual (OR-1) (KP-1) JIB1.0031 PK
- Passenger cars. Overall repair manual (OR-2) (KP-2) JIB1.0030 PK
- Instructions for welding and surfacing of components and parts when repairing passenger cars ИЛ-201-2019

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List of required tools:

Item No.	Description	Hereinafter	Paragraph number of this
1	Wrench for parts with a hexagonal socket S6 GOST 11737-93 (ISO 2936-83)	Wrench S6	2.1.4, 3.2.1.1
2	Wrench S8 GOST R ISO 3318 - 2013 / DIN 894-8 (ISO 3318)	Wrench S8	3.2.4.1
3	Wrench 7811-0316 GOST 16984-79 / DIN 1810-B 40-42	Specialized wrench	3.2.2.2

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2.1 Installation of the valve into the tank of the car.

When welding, it is recommended to use an attachment valve installer dwg OK-0112CB (Fig. 3).

- 2.1.1 Weld the bridge (Tag No. 28) dwg K-0301.00.00.033/4 (Fig. 1, Fig.2) at a distance of 47 ± 1 from the ends of the adapting pipes (Tag No. 20) dwg K-0116.00.00.001 controlling the interaxial size of 60 mm, while the upper ends of the adapting pipes (the valve seating point) should be protected from welding at a distance of minimum 25 mm.
- 2.1.2 Weld two adapting pipes (Tag No. 20) (Fig. 1, Fig.2) with a bridge to the water filling pipes, holding the size of 85mm and controlling the interaxial size of 60 mm. At the same time, the upper ends of the adapting pipes (the valve seating point) should be protected from welding at a distance of minimum 25 mm. After welding, clean the surface of the distribution collector and welding seams from splashes and slag. Flush the inner surfaces of the pipes and the surface of the distribution battery.
- 2.1.3 Moisten rings (Tag No. 16) of the fitting (Tag No. 15) with water. Put the T-connector (Tag No. 1) with the fittings (Tag No. 15) on the adapting pipes (Tag No. 20) and settle it until it stops by a manual effort evenly, without cocking, while the signal fitting (Tag No. 27) should be directed towards the overflow pipe (Fig.4).
- 2.1.4 Tighten the hexagon socket head cap screw (Tag No. 18) with the spring washer (Tag No. 19) with the S6 wrench until it stops.
- 2.1.5 Insert the signal tube (Tag No. 11) inside the overflow pipe (Tag No. 12), excluding its contact with the float (Tag No. 4) and the bracket (Tag No. 8) of the valve. Float (Tag No. 4) should rise and fall with ease by gravity, without coming into contact with the signal tube (Tag No. 11).
- 2.1.6 Install the distribution collector with the equipped valve on the car. Install filters dwg K-0212.00.00.000CB (supplied) between the flanges of the water-filling pipes.
- 2.1.7 Check performance of the valve by conducting test refill of the tank with water on both sides of the railway car.

ATTENTION!

Before each valve test, control the level of water filling of the tank for no more than 80% (example of control: drain from the full tank for at least 5 minutes or up to the level of 75% according to the light indication).

The valve is operating normally, if water supply to the tank stops after the tank is filled (valve actuation) and weak flow of water from the warning pipe can be seen.

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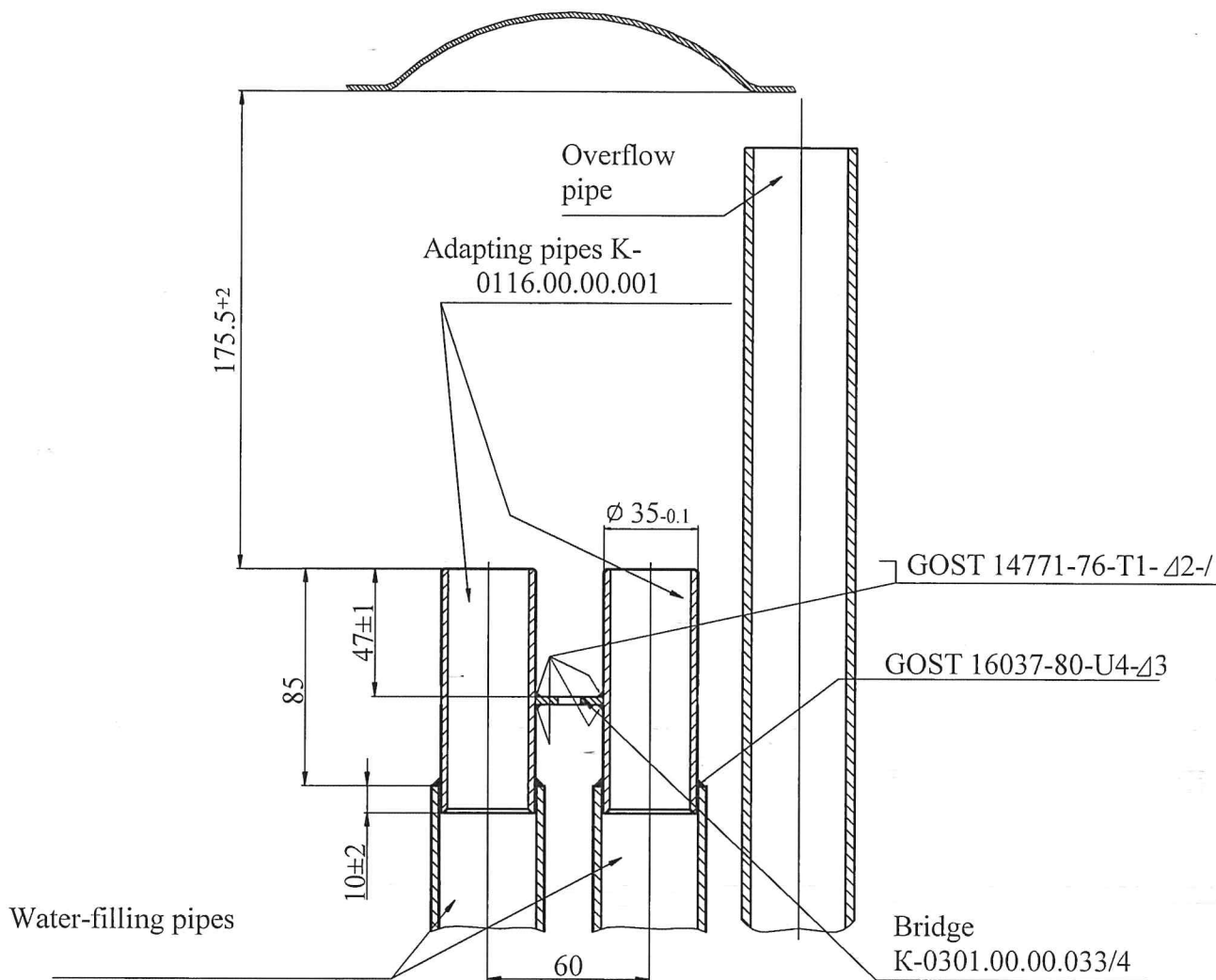


Fig. 2 - Installation of the valve into the tanks of 61-4514 model cars with a removable distribution collector.

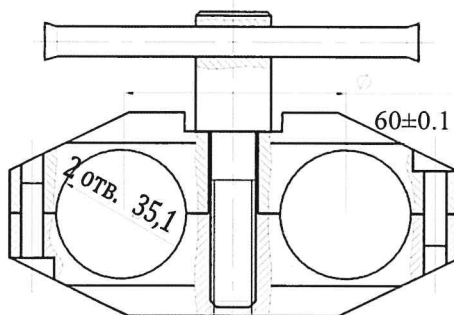


Fig. 3 - Attachment valve installer dwg OK-0112CB.

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3 Maintenance and repair

3.1 Technical maintenance M-1; M-1; M-3, Depot repair (DR)

3.1.1 When the railway car is received for all types of scheduled repairs, performance of the valve shall be checked by conducting test refill of the tank with water on both sides of the railway car.

ATTENTION!

Before each valve test, control the level of water filling of the tank for no more than 80% (example of control: drain from the full tank for at least 5 minutes or up to the level of 75% according to the light indication).

The valve is operating normally, if water supply to the tank stops after the tank is filled (valve actuation) and weak flow of water from the warning pipe can be seen.

3.1.2 If deviations from the correct operation of the valve are detected, the cause should be determined and the fault corrected in accordance with clause 4 of this OM.

3.2 Overall repair (OR-1, OR-2, Overall Reconditioning)

For all types of OR, remove the valve from the distribution collector in order to replace the following rubber-technical products (RTP), regardless of the condition (Fig. 1):

- Ring 034-038-25 GOST 9833-73 1 piece / item (Tag No. 26)
- Ring 030-035-30 GOST 9833-73 2 pcs. / items (Tag No. 29)
- Ring 021-027-36 GOST 9833-73 2 pcs. / items (Tag No. 30)
- Ring 035-040-30 GOST 9833-73 2 pcs. / items. (Tag No. 16)
- Ring 005-007-14 GOST 9833-73 2 pcs. / items. (Tag No. 33)


3.2.1 Removing the valve from the distribution collector (Fig. 1)

3.2.1.1 Unscrew the hexagon socket head cap screw (Tag No. 18) with the spring washer (Tag No. 19) with the S6 wrench.

3.2.1.2 Remove the signal tube (Tag No. 11) from the overflow pipe. Remove the valve from the adapting pipes (Tag No. 12) by a manual effort, without cocking.

3.2.2 Replacing the ring 034-038-25 GOST 9833-73 (Tag No. 26) (Fig. 1)

3.2.2.1 Remove two fittings (Tag No. 15) from the T-connector by a manual effort (Tag No. 1)

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3.2.2.2 Secure the valve through the soft jaws in the vise by the upper part of the T-connector (Tag No. 1). Unscrew the nut (Tag No. 25) (specialized wrench), unscrew the FSD (Tag No. 3) by a manual effort from the adapting pipe (Tag No. 2) holding on to the reflector (item 7). Replace the ring (Tag No. 26) with a new one, preventing it from twisting. Moisten it with water. Screw the FSD (Tag No. 3) on the adapting pipe (Tag No. 2) until it stops. Place the signal fitting (Tag No. 27) perpendicular to the axis of the tee in the direction of its concave part according to the figure 4. Avoiding slipping of the FSD (Tag No. 3) behind the reflector (Tag No. 7) tighten the nut (Tag No. 25) until it stops rightly (specialized wrench).

3.2.3 Replacement of fitting rings (Tag No. 15) (Fig. 1)

- Ring 030-035-30 GOST 9833-73 (Tag No. 29)
- Ring 021-027-36 GOST 9833-73 (Tag No. 30)
- Ring 035-040-30 GOST 9833-73 (Tag No. 16)

3.2.3.1 Without disassembling the fitting (Tag No. 15) (Fig.1), by pressing the lower nut and squeezing the spring, replace the rings 021-027-36 (Tag No. 30) of the check valves (Tag No. 17) with new ones, preventing them from twisting. Replace the O-rings (Tag No. 29) and (Tag No. 16) with new ones, preventing them from twisting.

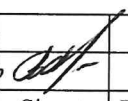
3.2.4 Replacing the rings 005-007-14 (Tag No. 33) (Fig. 1)

3.2.4.1 Unscrew the nut (Tag No. 21) (wrench S8), remove the washer (Tag No. 6), the ring (Tag No. 33), the signal fitting (Tag No. 27), the ring (Tag No. 33). Replace the rings with new ones. Install the elements in reverse order, while placing the signal fitting (Tag No. 27) perpendicular to the bracket (Tag No. 8). Tighten the nut (Tag No. 21) (S8 wrench).

3.2.5 Insert the fittings (Tag No. 15) by a manual effort into the T-connector (Tag No. 1) after wetting the rings with water (Tag No. 16)

3.2.6 Installation of the valve into the tank of the car shall be performed according to p. 2.1.3 – 2.1.7.

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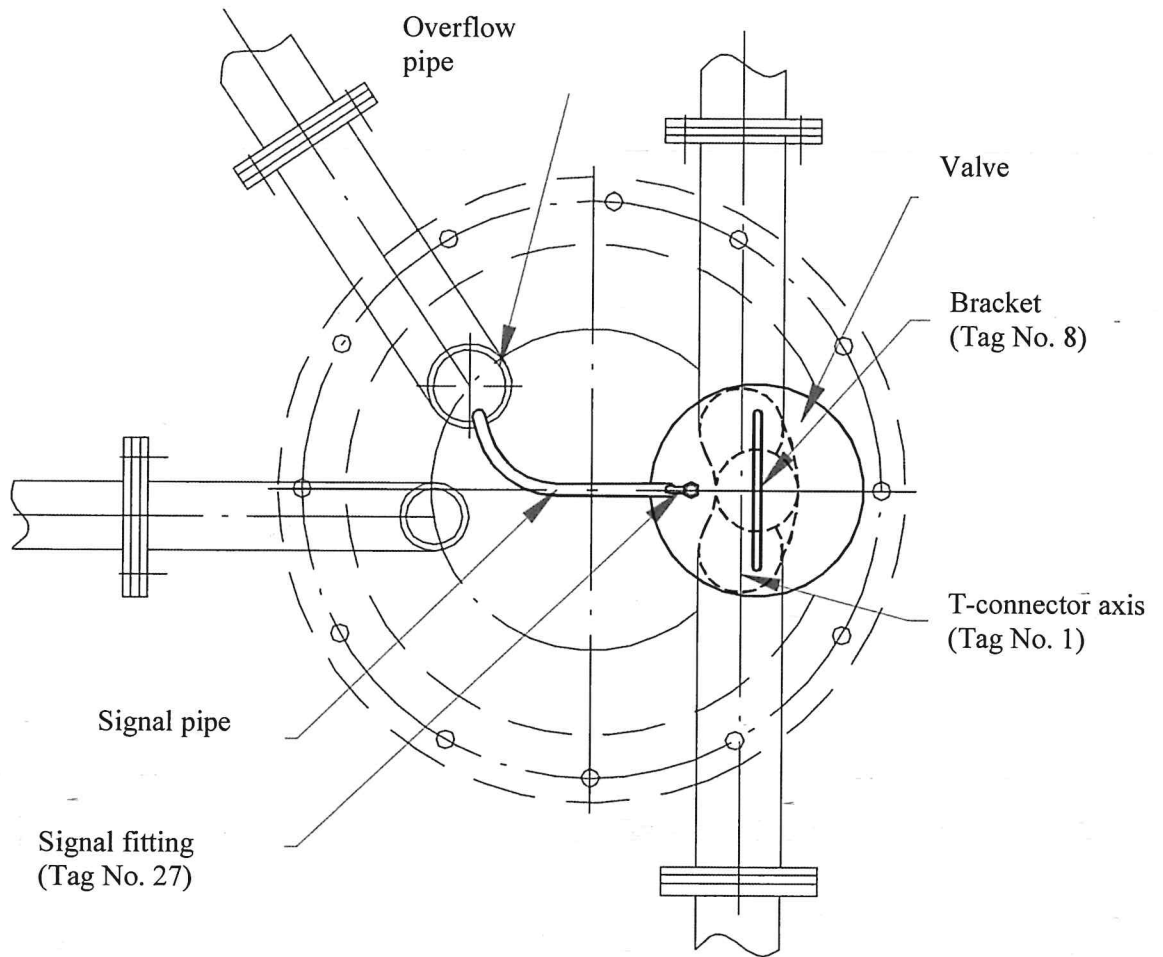


Fig. 4 - Location of the valve on the distribution collector.

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4 Troubleshooting

4.1 Table of possible faults:

1	2	3	4
Item	Possible faults	The cause of the fault	Troubleshooting methods
4.1.1	The valve reacts immediately after opening of the pressure line valve	-	Remove the FSD and replace it with a serviceable one according to p. 3.2.1, p. 3.2.2.
4.1.2	The valve does not shut off the water supply into the tank after filling it up	-	Remove the FSD and replace it with a serviceable one according to p. 3.2.1, p. 3.2.2.
4.1.3	Water leak from opposite sides of the car when filling	Intrusion of foreign objects	Remove the faulty check valve (Tag No. 17) of the fitting (Tag No. 15) remove and replace the ring 021-027-36 (Tag No. 30) of the faulty check valve (Tag No. 17) (Fig. 1) with a new one according to p.3.2.1, p.3.2.2. 1, p.3.2.3.1
		Wear of ring 021-027-36 (Tag No. 30) of the check valve (Tag No. 17)	

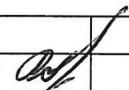
4.2 Removing the valve from the car tank.

Access to the valve during the installation can be secured in two ways:

- by removing the collector distribution;
- by removing the roof hatch of the car and the tank cover.

4.3 Installation of the valve into the tank of the car shall be performed according to p. 2.1.3 – 2.1.7.

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5 Marking

The outer surface of the reflector (item 7) (Fig.1) is marked with labels:

- Manufacturer's trademark (Fig. 5);
- valve number;
- date of manufacture: the last two digits of the year.



Fig. 5

6 Storage and transportation

Storage and transportation conditions – enclosed unheated rooms with natural ventilation (Zh3 according to GOST 15150-69).

7 Warranty

The warranty period of the valve storage is 2 years, the warranty period of operation is 3 years from the moment of commissioning, while meeting the requirements of storage, installation, maintenance and operation by the consumer.

The application for manufacturing and delivery of valves should be sent to the address: 129626, Moscow, POB 49.

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ООО IVP-ED constantly works to improve its products and reserves the right to introduce changes in the design meant to improve its performance.

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8 Revision sheet

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