OM-E-MX1N-110413-2

INSTALLATION, OPERATION AND HANDLING MANUAL

Steam – Water – Mixing Valve
MODEL: MX1N

MIYAWAKI INC.
Osaka, Japan

CONTENTS

This Handling Manual should be used by experienced personnel as a guide to the installation and maintenance of the Steam-Water-Mixing Valve.
Selection and Installation of this Mixing Valve should always be accompanied by competent technical assistance.
If further information is required we ask you to contact MIYAWAKI or our local Representative.

1. Before using the Mixing Valve

(1) Confirm the ratio between the steam and cold water pressure !

This ratio should be as follows:

$$3 \geqq \frac{\text{Steam Pressure}}{\text{Cold Water Pressure}} \geqq \frac{1}{3}$$

If the ratio between steam an cold water pressures will be greater than 3:1 or 1:3 you cannot get the required hot water temperature. Therefore we recommend to install pressure gauges in the steam and water lines.

(2) Confirm accessories:

Strainer	-	2 pcs.
Check Valves	-	2 pcs.
Dowels and screws for the Valve body	-	4 pcs.

Furthermore you should prepare the following items for installation:

Union	-	3 pcs.
Ball Valve	-	2 pcs.
Thermometer	-	1 pcs.
Pressure Gauge	-	2 pcs.

(3) Take the flow chart of the MX1N and confirm that your hot water flow will be within the minimum and maximum limits shown in the flow chart.

2. Installation

(1) Fix the Mixing Valve with the Bottom Flange to the wall.

Dimensions:

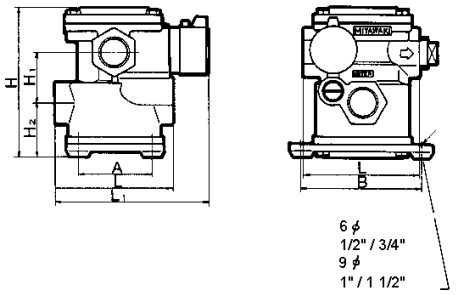


Fig. 1

Connections	Size	Dimensions *inches and millimeters*						
		L	**L 1**	**H**	**H1**	**H2**	**A**	**B**
Screwed	**½"** **¾"**	**3.9** *100*	**5.4** *138*	**5.3** *134*	**1.7** *43*	**1.8** *47*	**2.4** *62*	**4.0** *102*
	1"	**5.5** *140*	**7.0** *179*	**6.6** *168*	**2.2** *57*	**2.0** *51*	**3.4** *86*	**5.8** *147*
	1 ½"	**6.3** *160*	**7.4** *189*	**7.8** *197*	**2.8** *70*	**2.4** *60*	**3.4** *86*	**5.8** *147*

Attention: **The dimensions of the MX1N with NPT threads do not correspond with the above table. Please, refer to the Miyawaki Product drawing of the related valve.**

(2) Connect the steam pipe with the steam inlet of the valve and the cold water pipe with the water inlet of the valve (Refer to the marks "STEAM" and "WATER" on the body).

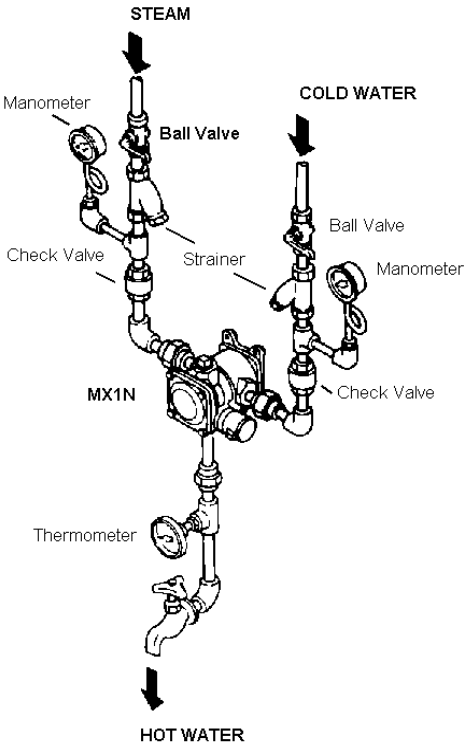


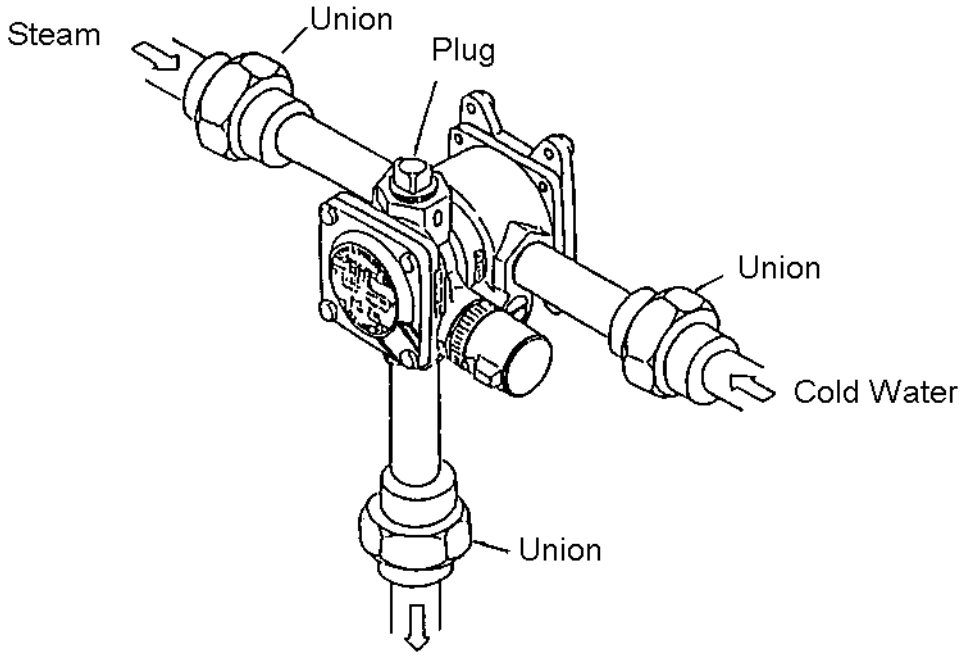
Fig. 2

(3) As you can see in Fig. 2 we recommend to install as well Strainer and Check Valve in the lines as Ball Valve, Pressure Gauge and Thermometer.

(4) The Mixing Valve has two outlets. One of them is closed by a plug. Dependent on the requirements each outlet can be used. It is possible to use both outlets at the same time, too.

(5) To remove the Mixing Valve easily for maintenance it is recommended to connect all pipes with unions to the valve.

Fig. 3



(6) In case of fluctuating steam pressure it is recommended to install a steam pressure reducing valve (we recommend Type RE from MIYAWAKI) to stabilize the pressure.
The same should be done in case of unstable water pressure.
The functioning of the Mixing Valve may be affected adversely in case of unstable inlet pressures.

(7) Please, install only items with low flow resistance in the hot water line (for instance take Ball valves with full bore) to reduce the back pressure to a minimum.

(8) Pay attention that the size of the hose at the hot water outlet is the same as the connecting size of the Mixing Valve. Otherwise it may happen that the hot water flow will be too low and the Mixing Valve will not operate.

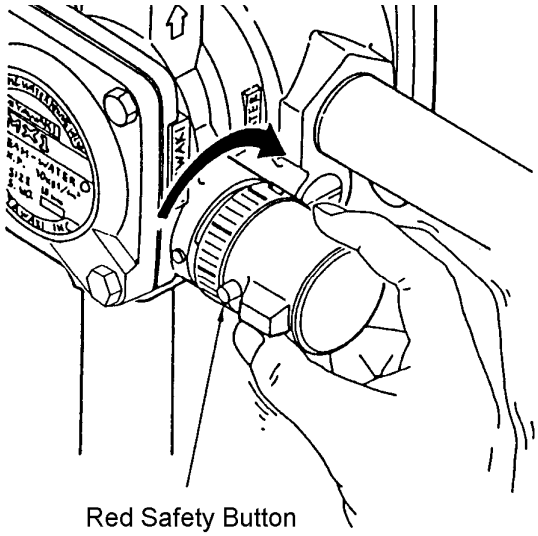
3. Operation of the Mixing Valve

For safety reasons the blue handle is setted at cold water temperature at the time of delivery.
When using the Mixing Valve the first time, please, pay attention to the following:

(1) Open the cold water inlet and the hot water outlet and check whether cold water is discharging from the hot water outlet.

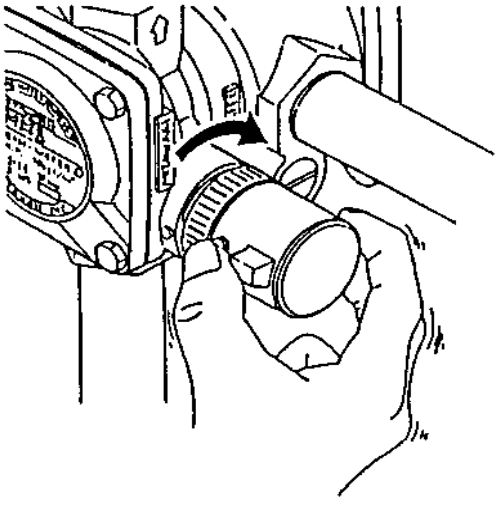
(2) Now open slowly the ball valve at the steam inlet pipe. Turn the blue handle slowly to the right until stopped by the red safety button.
Do not push the red safety button.
The hot water must reach now a temperature of about 40°C (104°F).

Fig. 4



(3) In case a higher hot water temperature is requested, push the red safety button and turn the blue handle to the right. Stop when the requested hot water temperature will be reached.

Fig. 5



4. Troubleshooting

Trouble	Possible Problem	Measures
No hot water	Ratio of steam pressure to water pressure is higher than 3:1 or 1:3 (see point 1.1).	Change the steam or water pressure until the necessary ratio will be reached.
	The cold water pressure is lower than 0,35 bar.	Increase water pressure
	The hot water flow is smaller than the requested minimum flow (see point 1.3.).	Change the pipe size. If not possible contact MIYAWAKI.
	The steam inlet valve is closed.	Open the steam inlet slowly.
	The steam side strainer is plugged	Clean the strainer.
	No steam is coming to the inlet.	Check, whether the check valve is installed correctly.
	Internal strainer (No. 42) is plugged.	Clean the strainer.
	Diaphragm (No. 11) is not working.	Change the diaphragm.
	Diaphragm unit is not working.	Check, whether the shaft can be moved. If not, clean the shaft.
	Bimetal unit is not working (rusty).	Change the bimetal unit.
Hot Water is flowing only temporarily.	Either steam pressure or water pressure are fluctuating rapidly.	Try to stabilize the inlet steam and water pressure.
The blue knob is turned to lower temperature, but temperature remains high.	The main valve is not closing.	Clean the main valve. If there will be no result, change the main valve unit.
	The shaft of the diaphragm unit is not moving.	Clean the shaft or change it.
	The bimetal unit is not working.	Change the bimetal unit.

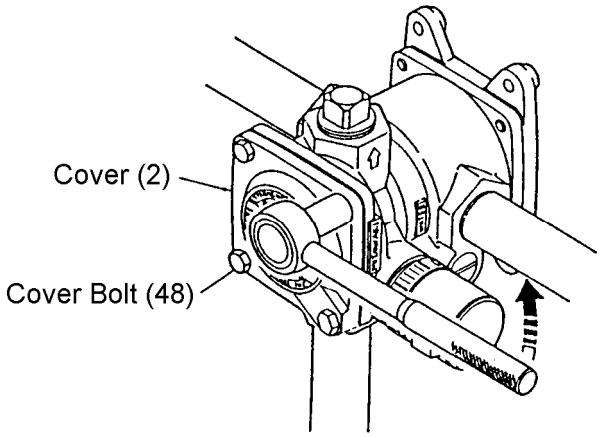
5. Maintenance

5.1. Disassembly of the Valve

(1) Loose the cover bolts (No. 48 and No. 71, 4 pcs.)

Valve Size	Cover bolt size
½"	10 mm (0.39")
¾"	10 mm (0.39")
1"	17 mm (0.67")
1 ½"	17 mm (0.67")

Fig. 6



(2) Take out the Diaphragm Unit carefully not damaging the diaphragm.
Pay attention, that the ½" and ¾" – Valves have a pressure valve spring which may jump out.

Fig. 7-A

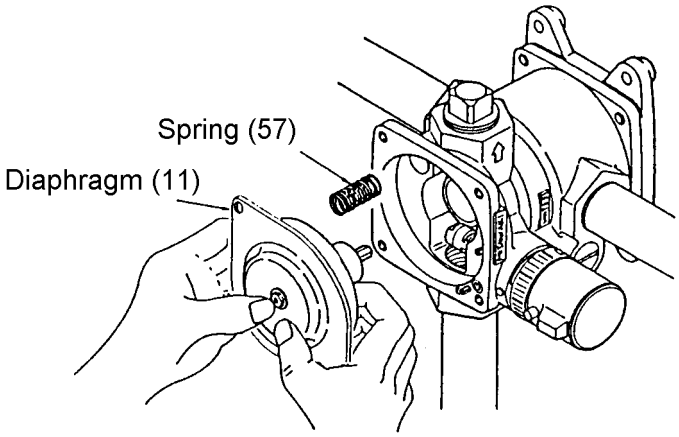
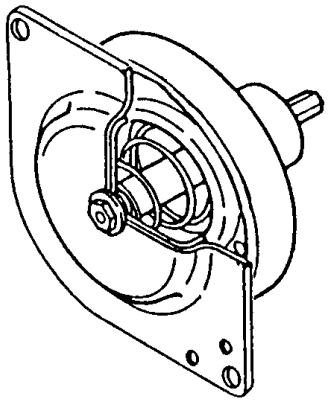


Fig. 7-B



Diaphragm Unit

(3) Remove the handle cap by a screwdriver (Fig. 8-A).
Loose the screw (No. 41) by a driver (Fig. 8-B) and remove the handle from the adjust unit (Fig. 8-C).

Fig. 8-A

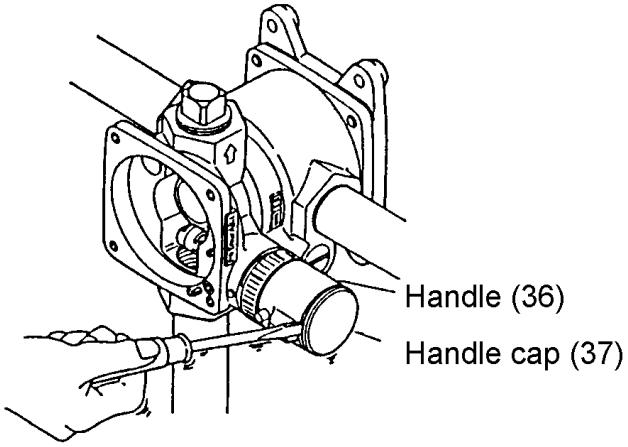
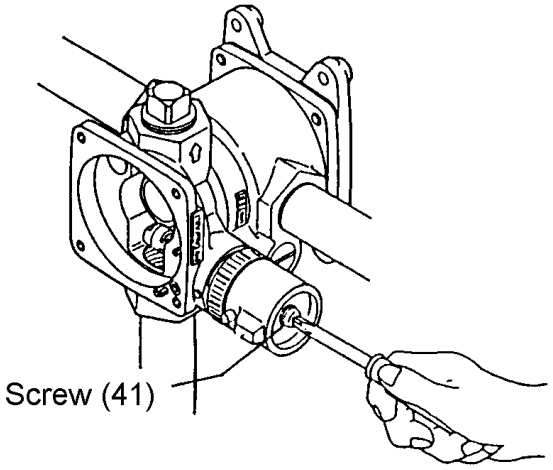


Fig. 8-B



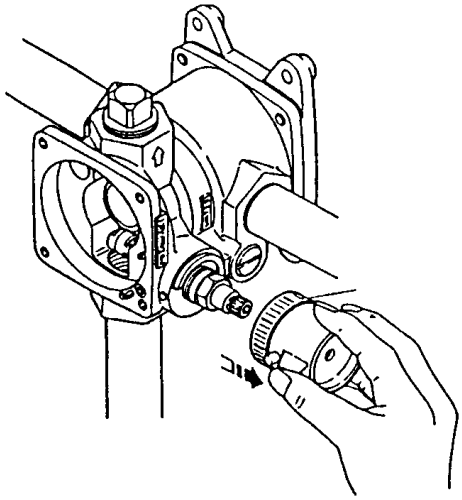
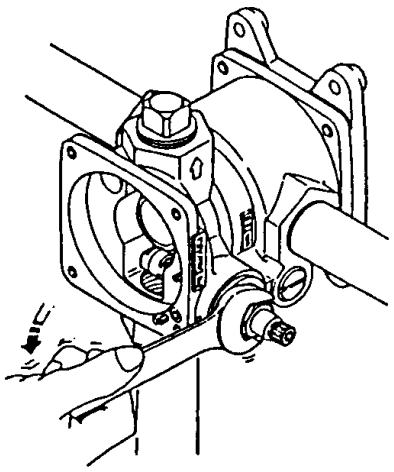


Fig. 8-C

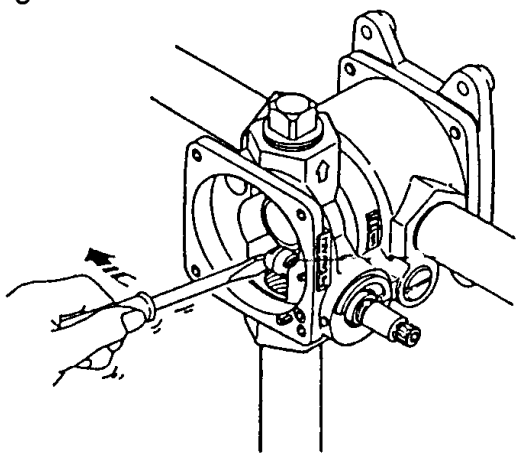
(4) Loose the bush (No. 35) and take it out (Fig. 9-A).

Fig. 9-A

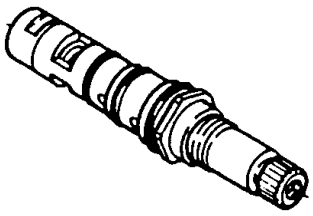


By pushing with a screwdriwer towards the bimetal unit, the bimetal unit can be taken out easily (Fig. 9-B).

Fig. 9-B



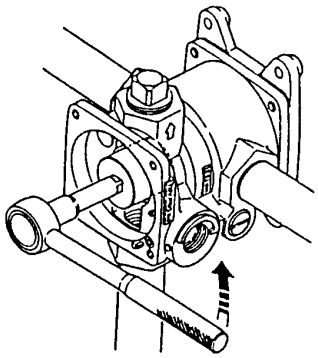
Bimetal and Adjust Unit



(5) The Main Valve can be removed by loosing the main valve seat with a socket wrench (Fig. 10-A).

Valve Size	Socket wrench Size
½"	27 mm (1.06")
¾"	27 mm (1.06")
1"	38 mm (1.50")
1 ½"	46 mm (1.81")

Fig. 10-A



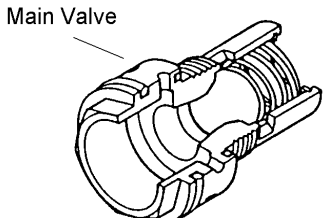


Fig. 10-B

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After having cleaned all parts and changed the damaged ones the Mixing Valve may be assembled in the opposite way.

(1) Screw the Main valve unit inside the body. Then fasten the Main valve unit. Pay attention to the required torque.

Valve Size	Fastening Torque
½"	450 kgf • cm
¾"	450 kgf • cm
1"	800 kgf • cm
1 ½"	1.300 kgf • cm

(2) Screw the adjust unit carefully inside the bimetal unit (Fig. 12-A). Then insert the unit inside the valve by turning slightly to the right and left (Fig. 12-B). Pay attention, that the O-Rings of the bimetal and adjust unit are not damaged. Fasten the bush (No. 35) with a torque of 100 kgf • cm. Then screw out the adjust unit slightly (Fig.12-C).

Fig. 12-A

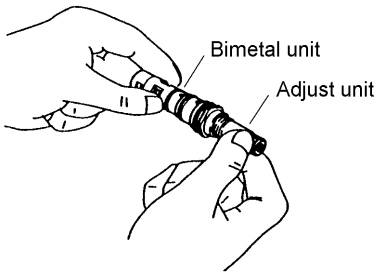


Fig. 12-C

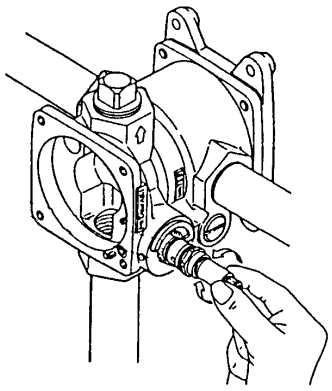
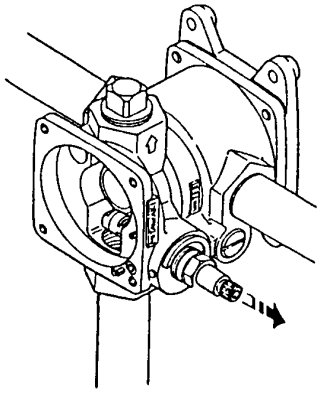
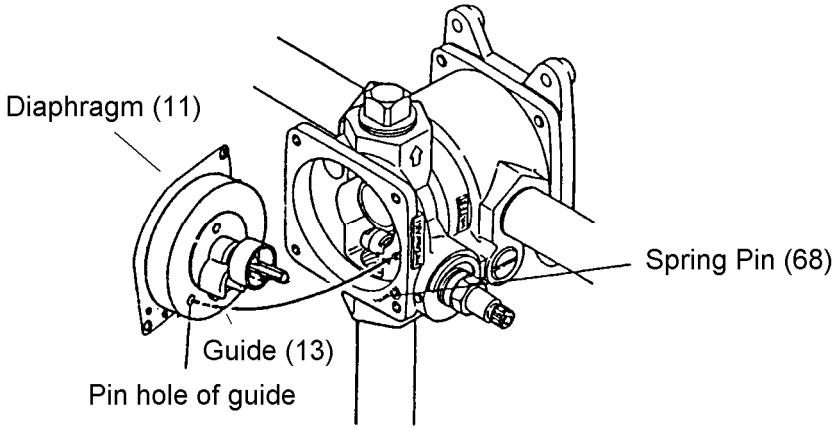


Fig. 12-B



(2) Insert the diaphragm unit into the body. Pay attention that the pin hole of the guide (No. 13) will meet the pin of the body (Fig. 13-A).
Furthermore the pin hole of the diaphragm should also meet the related pin of the body (Fig. 13-C).

Fig. 13-A



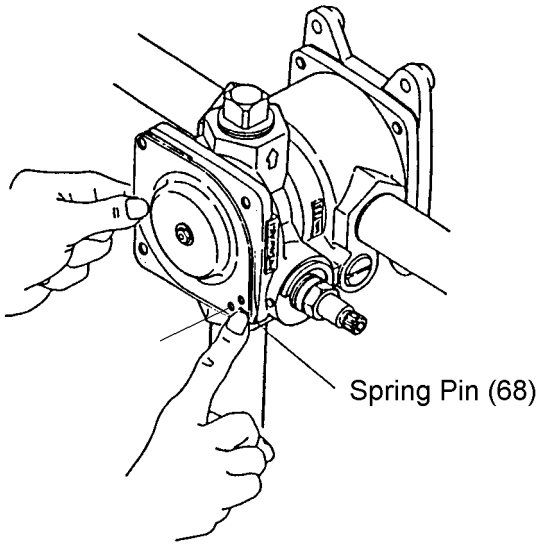


Fig. 13-B

(3) Connect the cover with the body. The pin hole of the cover must meet the pin of the body (Fig. 14).
Fasten the cover bolts with the following torque equally crosswise:

Valve Size	Fastening Torque
½”	70 kgf • cm
¾”	70 kgf • cm
1”	150 kgf • cm
1 ½”	150 kgf • cm

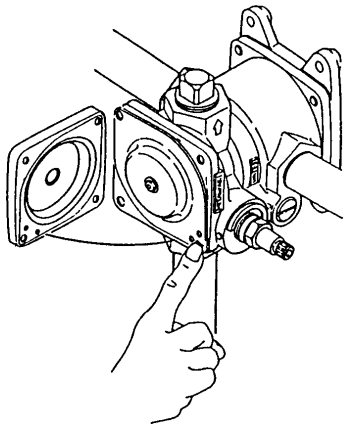


Fig. 14

(4) Adjust the hot water temperature to 40°C (104°F) by turning the shaft of the adjusting unit (Fig. 15).
After adjustment of the 40°C (104°F) fix the handle to the adjust unit so that the red safety button of the handle will correspond with the red marker on the body (Fig. 16).

Fig. 15

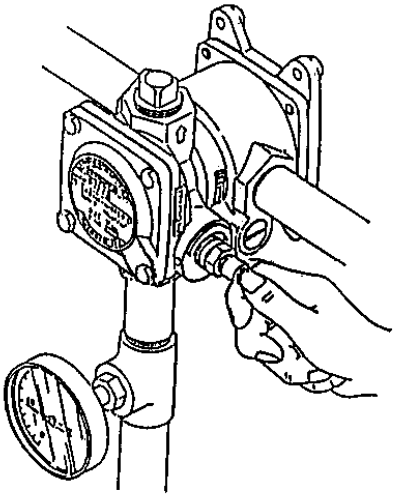
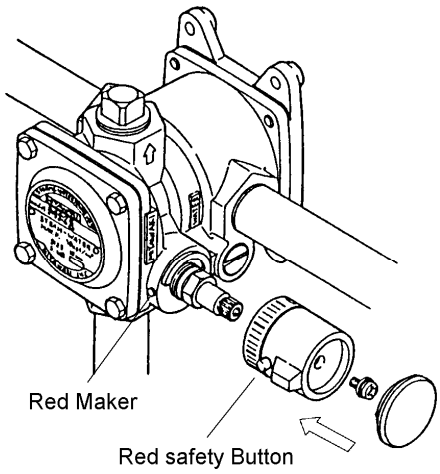
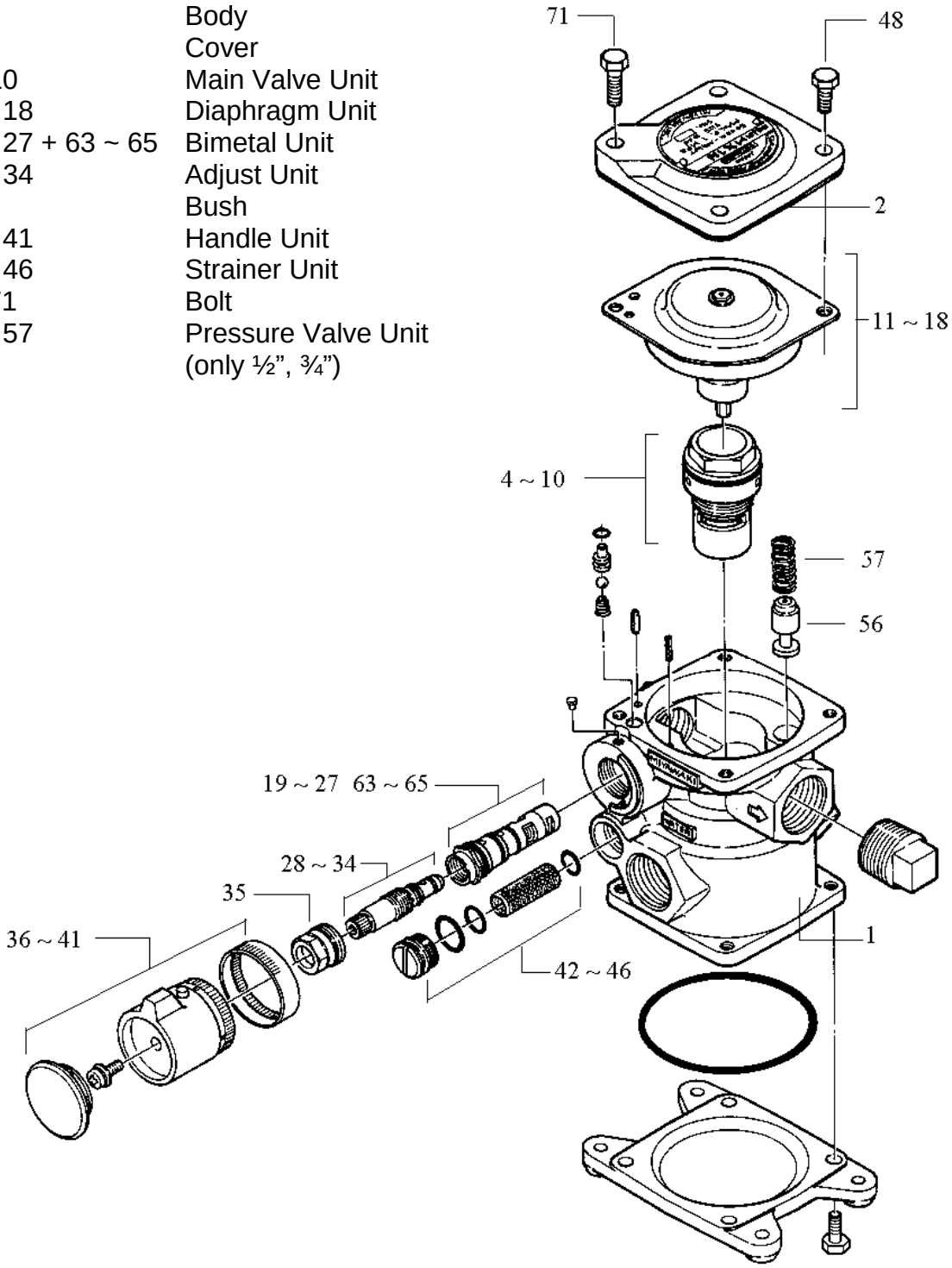


Fig. 16



1	Body
2	Cover
4 ~ 10	Main Valve Unit
11 ~ 18	Diaphragm Unit
19 ~ 27 + 63 ~ 65	Bimetal Unit
28 ~ 34	Adjust Unit
35	Bush
36 ~ 41	Handle Unit
42 ~ 46	Strainer Unit
48, 71	Bolt
56 ~ 57	Pressure Valve Unit (only ½", ¾")



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