

# POWERS

A WATTS INDUSTRIES CO.

## TECHNICAL INSTRUCTIONS

Hydroguard 400 Valves

Models 1-6

Form TI400 v2

### OPERATION

Hot and cold water enter their respective ports and the pressures are equalized through the action of the balancing poppet (1). The entire balancing poppet assembly is contained in a celcon chamber (2). This chamber is replaceable as a complete cartridge. After the hot and cold pressures are equalized, they are mixed by the action of the mixing plate (3). As the temperature adjustment stem is rotated from shutoff to maximum hot water temperature (approximately 180°), the mixing plate passes the required proportion of hot and cold water to produce the control point. With the adjustment stem in its full clockwise position, shutoff is obtained by shutting off both supplies. The maximum temperature stop (4) allows the user to set the maximum discharge temperature. This mixer does not recognize supply water temperature changes so any variation in the water temperature will affect the control point and the maximum temperature setting.

### SPECIFICATIONS

#### Operating Capacity

Model 1-3..... 9 GPM @ 45 psi (.57L/sec @ 310 kPa)

Model 4 3-port..... 6 GPM @ 45 psi (.38L/sec @ 310 kPa)

4-port

Top ..... 6 GPM @ 45 psi (.38L/sec @ 310 kPa)

Bottom.... 6 GPM @ 45 psi (.38L/sec @ 310 kPa)

Model 6..... 6 GPM @ 45 psi (.38L/sec @ 310 kPa)

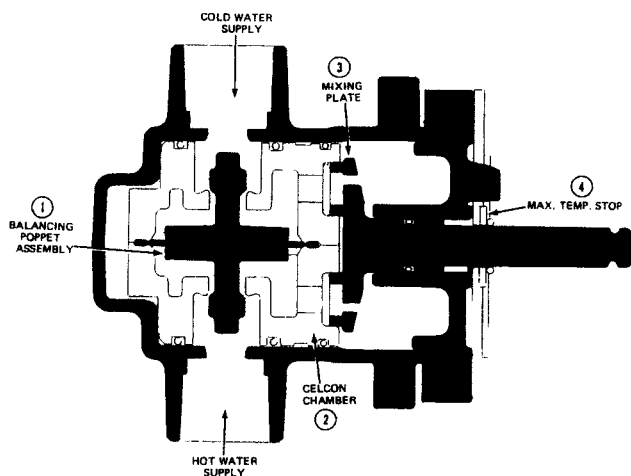
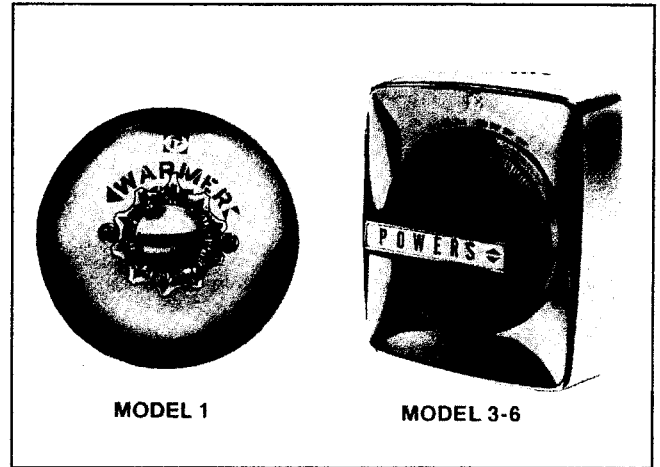


FIGURE 1

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#### Inlet and Outlet Sizes

Model 1-3: Inlet and Top..... 1/2" NPT  
Bottom ..... 3/4" NPT

Model 4-6, all ports..... 1/2" NPT

Maximum pressure (static)..... 125 psi (862 kPa)

Maximum inlet temperature..... 180°F (82°C)

Built-in shutoff ..... All models

Roughing-in template ..... All models

Maximum temperature adjustment..... All models

### MAINTENANCE

#### Troubleshooting Pointers

What to look for if:

- The flow of water is less than desired.
  - Valves upstream from supply not fully open.
  - Low supply pressures.
  - Accumulation of lime deposits in hot water pipes, restricting the flow of hot water.
  - Shower head clogged.
- Flow of water is completely shut off.
  - Valves upstream from supply completely closed.
  - Failure of hot or cold water supply pressure. The Hydroguard is constructed to restrict the flow of water on hot or cold water supply failure,
- The temperature of the water goes from hot to cold when the adjustment handle is rotated counter-clockwise.
  - The water supplies are connected to the wrong port.
- Flow of water continues when Hydroguard is shut off.
  - Worn SHUTOFF DISCS. Replace worn disc.
- Maximum temperature is too low.
  - Accumulation of lime deposits in hot water pipes, which restricts the flow of hot water.
  - The concealed maximum temperature is not at its maximum adjustment.
  - Hot water temperature too low.

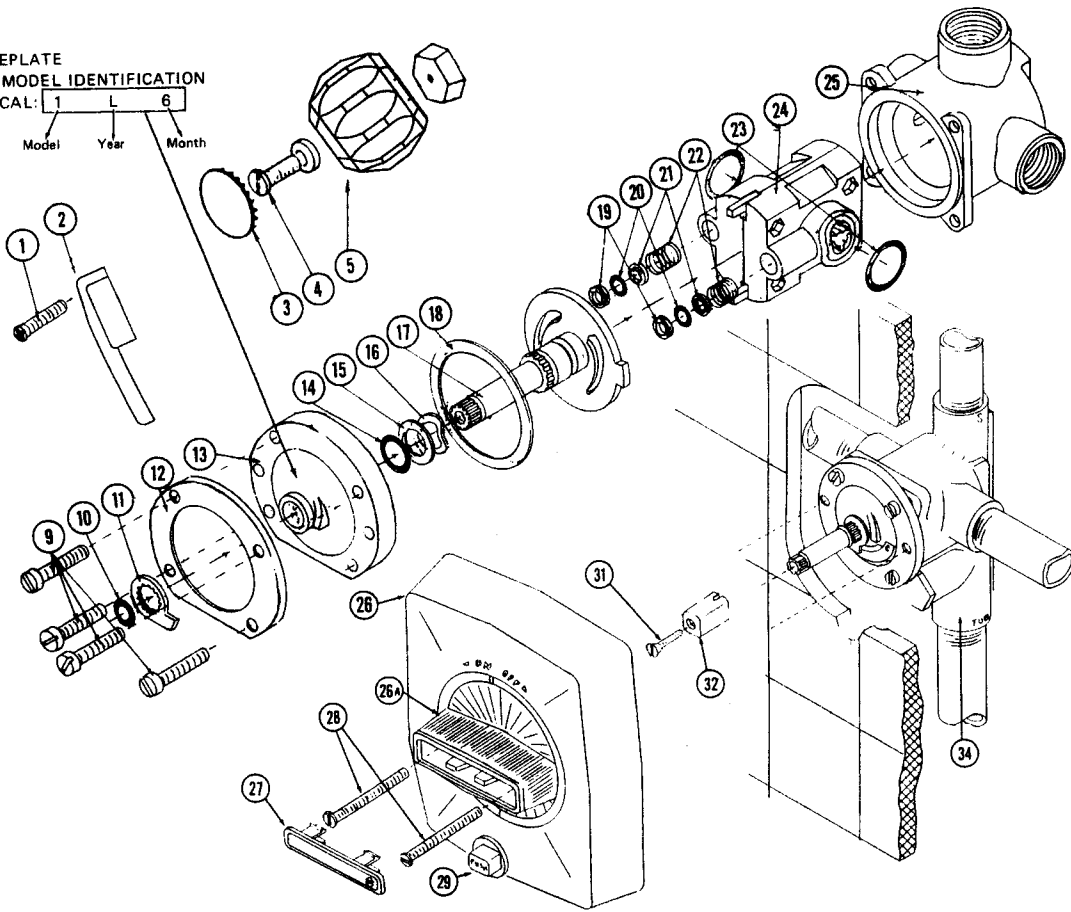
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HYDROGUARD 400 MODELS 1-3

NAMEPLATE  
FOR MODEL IDENTIFICATION  
TYPICAL: 

1	L	6
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Model Year Month



**PARTS LIST**

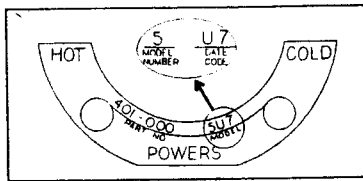
Item	Product No.	Description	Material	Item	Product No.	Description	Material
1	034-224G	Handle Screw (8-32 x 1/4")	C.P. Steel	19	*	Shut-Off Disc	Buna-N
2	420-301E	Lever Handle	C.P. Cast	20	410-366 (25)	O-Rings	Buna-N
3	420-314 (4)	Plug Button	C.P. Steel	21	*	Guide	Brass
4	034-515K	Handle Screw (8-32 x 1/2")	C.P. Steel	22	*	Spring	Monel
5	420-300	Handle (includes items 3, 4, 5)	—	23	*	O-Ring (3/4 x 1/8 x 3/16")	Buna-N
5A	420-125	Insert	—	24	*	Cartridge	Celcon
9	030-889	Bonnet Screws (10-24 x 1/8")	Stainless Steel	25	N/A	Body	Bronze
10	410-366 (25)	O-Ring (3/8 x 1/2 x 1/16")	Buna-N	26	400-062	Dial Plate (includes 27, 28, 31, 32)	—
11	410-371 (6)	Temperature Stop	Brass	26A	401-086	Handle Only	Duralac
12	410-377	Support Ring	Stainless Steel	27	401-090	Plug Button	—
13	410-346	Bonnet	Noryl	28	420-216 (20)	Screw (8-32 x 2")	Steel
14	410-366 (25)	O-Ring (3/8 x 1/2 x 1/16")	Buna-N	29	401-092	Button in Kit 400-085	Duralac
15	410-368 (15)	Washer	Synthane	30	OBS	Dial Plate with Diverter Assembly	—
16	410-369 (10)	Wavy Washer	Stainless Steel	31	032-064	Screw (8-32 x 1/2")	Brass
17	*	Adjustment Stem	—	32	401-088	Stem Guide	C.P. Cast
18	*	Bonnet Gasket	Rubber	34	OBS	Body (Diverter)	Bronze

( ) Number of items per package.

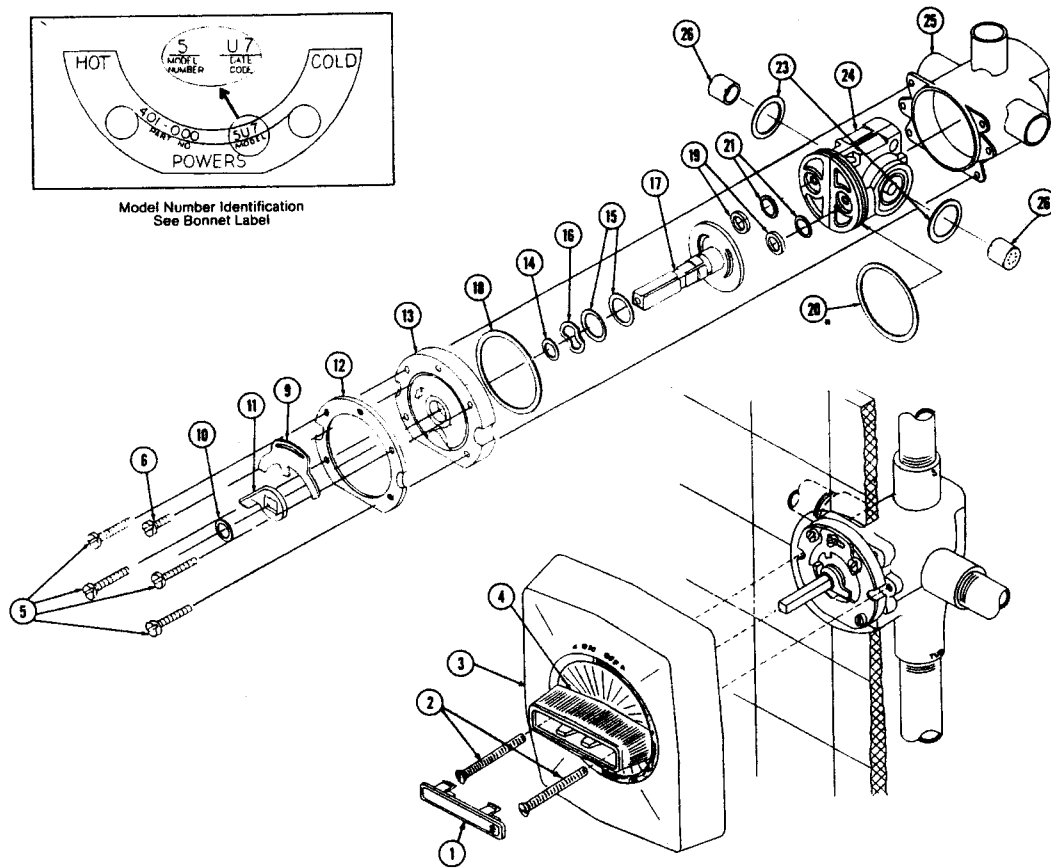
\* Available in kits (page 2).

NOTE: Model 1 dial is not available.

**Hydroguard 400**  
**Models 4-6**



Model Number Identification  
 See Bonnet Label



**PARTS LIST**

Item	Product No.	Description	Material	Item	Product No.	Description	Material
1	401-090	Plug Button	—	15	410-368 (15)	Flat Washer	Synthane
2	080-008	Screws	Brass	16	410-369 (10)	Wavy Washer	St. Steel
3	401-230A	Complete Dial Assembly	—	17	*	Throttling Stem	Celcon
4	401-231	Handle	—	18	*	Bonnet Gasket	Rubber
5	030-885	Bonnet Screws 10-32 x 1"	St. Steel	19	*	Shut-Off Discs	Buna-N
6	030-884	Adj. Stop Screw 10-32 x 3/16"	St. Steel	20	*	O-rings 1 1/4 x 1 1/8 x 1/16"	Buna-N
9	401-228	Adjustment Stop	Stl. Zinc Pl.	21	*	Quad Rings	Buna-N
10	401-366 (25)	O-Rings 3/8 x 1/2 x 1/16"	Buna-N	23	*	O-Ring 3/4 x 15/16 x 3/32"	Buna-N
11	401-165	Max. Temp. Stp	Brass	24	*	Balance Chamber	Celcon
12	410-377	Support Ring	St. Steel	25	401-158	Body (4-Port)	Bronze
13	401-162	Bonnet	Noryl		401-160	Body (3-Port)	Bronze
14	410-366 (25)	O-rings 3/8 x 1/2 x 1/16"	Buna-N	26	401-210	Strainer Caps	Celcon

( ) Number of items per package.

\* Available in kits (page 2).

# POWERS

A WATTS INDUSTRIES CO.

## REPAIR FORM

Hydroguard 400/410/2000  
Pressure Balancing Valves  
All Models

### DESCRIPTION

The Hydroguard 400/410 pressure balancing valve insures safety to the bather upon hot or cold water supply pressure failure or change. The internal balance chamber forces the hot or cold water supply pressure to be equalized should either pressure fail or change. To ensure correct repair parts are installed, determine valve model by referring to bonnet label (see Figure 1). Once model number is determined, refer to appropriate chart to ensure correct kit has been supplied. **Since kits contain parts for multiple models, discard extra parts.**

### REPAIR INSTRUCTIONS

#### Replace Balance chamber if...

- The discharge water temperature is variable or untempered
- The valve leaks after it is completely shut off

#### Balance Chamber Removal:

**TO REMOVE THE BALANCE CHAMBER**, using a balance chamber extraction tool (Part No. 401-202) is highly recommended. To use the extraction tool, follow instructions below:

- Insert hooked ends of extraction tool into HOT and COLD outlet ports of the balance chamber (see Figure 2).
- Insert screwdriver down through end of extraction tool.
- Place a wood or plastic block (do not use metal) between screwdriver and valve body. Firmly ease screwdriver away and downward, using wood for added leverage as cartridge is gradually pulled out.

FIGURE 2: Balance Chamber Removal

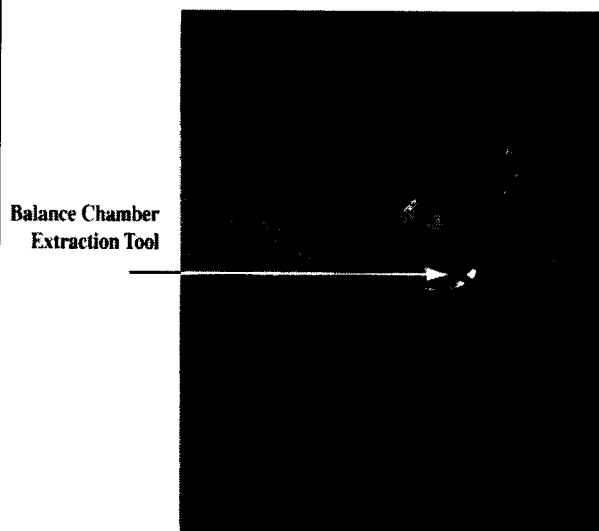
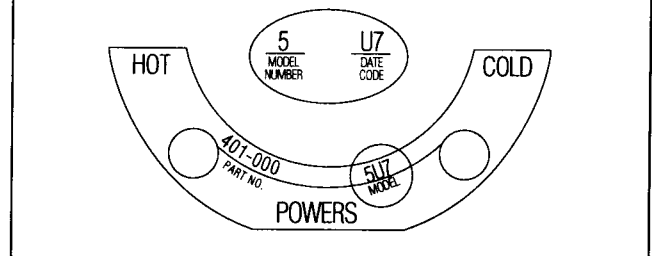


FIGURE 1: Determine Your Valve Model



#### Balance Chamber Installation:

- Apply a small amount of silicone supplied to inner surface of valve body and inlet O-rings of balance chamber.
- Align chamber and valve body inlet holes.
- Slowly push chamber in, being very careful not to pinch side O-rings (item 5A in figures 5 and 6).

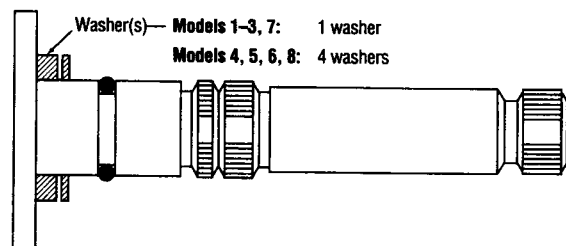
#### Replace Gasket and Discs if...

- Flow continues after mixer is turned off
- Stem or handle is damaged
- Water leaks at stem and/or bonnet

#### Gasket and Disc Replacement:

- Replace all gaskets and discs according to the diagrams as shown in figures 5 and 6. Use silicone gel provided on all O-rings and related surfaces. Never use grease.
- The number of flat washers required for installation on stem varies with each model. Refer to Figure 3 when replacing the washers.

FIGURE 3: Number of Flat Washers to Use By Model



**NOTE:** Be certain to refer to Figure 5 or Figure 6 to locate the appropriate parts and kits for your model.

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**REPAIR INSTRUCTIONS (CONTINUED)**

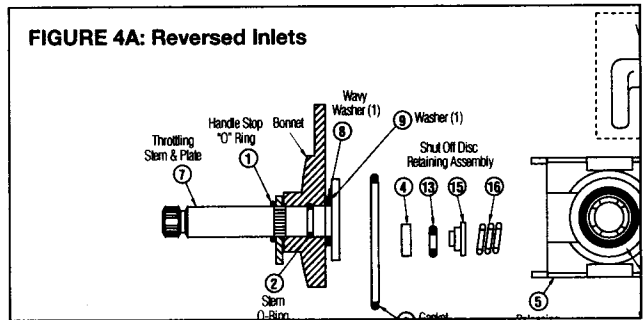
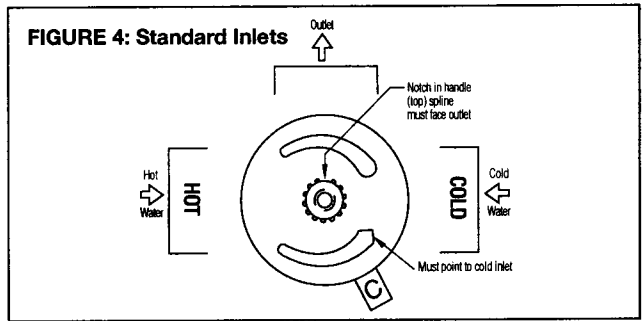
**Replace Stem and Plate if...**

- Flow continues after mixer is turned off
- Water leaks at stem and/or bonnet

**Stem and Plate Replacement**

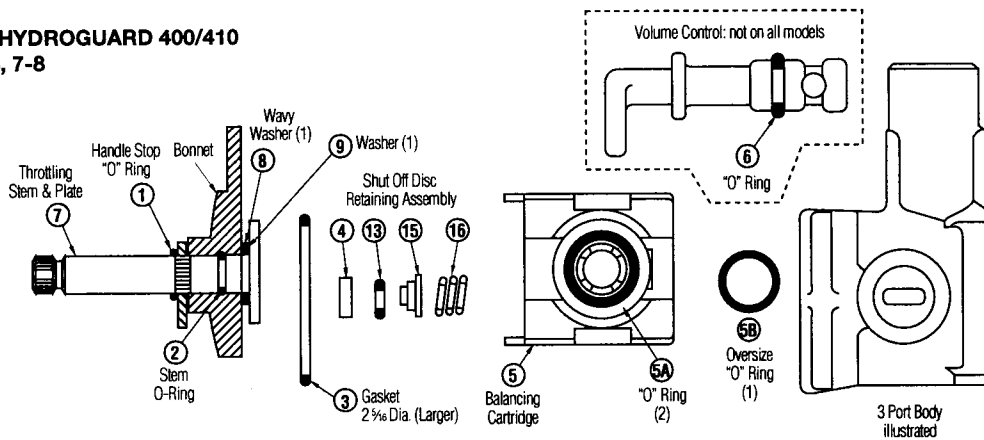
1. FOR STANDARD INLETS: Place the plate directly on top of the balance chamber (see Figure 4 for proper orientation of plate).
2. The flat notch on the splined stem must **FACE** the outlet port of the valve body for standard inlets (cold water entering COLD inlet port).
3. FOR REVERSED INLETS: (cold water entering hot inlet port), the flat notch on the splined stem must face **AWAY FROM** the outlet port. See Figure 4A for proper orientation of plate.

**NOTE:** For reversed inlets, be sure to clearly identify the Hot and Cold inlet ports to avoid confusion during future maintenance.



**PARTS**

**FIGURE 5: HYDROGUARD 400/410 Models 1-3, 7-8**



Troubleshooting		Repair Kit No.	Where Used	Repair Kit Includes (Numbers below correspond with numbers in Figure 5 above)
1. Cartridge slips while seated in body. 2. Flow continues after mixer is turned off and all other seals have been replaced.	Oversize 410 Inlet Seal Kit*	410-570*	400/410 All Models	1-4, 5A, 5B*, 6**
1. Water leak at stem and/or bonnet. 2. Flow continues after mixer is turned off.	Gasket and Disc Replacement	410-182	400/410 All Models	1-4, 5A, 6**
1. Variable or untempered discharge temperature. 2. Leakage after mixed is turned off.	Balance Chamber	401-183 (for any 3-port valve)	400: Models 1-3 410: Models 1-3, 7, 8 Metal and Plastic Bonnet	3-5, 5A, 13, 15, 16**
1. Flow continues after mixer is turned off. 2. Handle splines on stem damaged.	Stem and Plate Replacement	410-378	400: Models 1-3 410: All Models	1-4, 7-9***
		410-378A	419's only	1-4, 7-9*** 1-4, 7-9*** (shorter stem)

\* When using oversize O-ring (item 5B), discard ONE of the two regular sized O-rings (5A) normally used and use item 5B in its place.

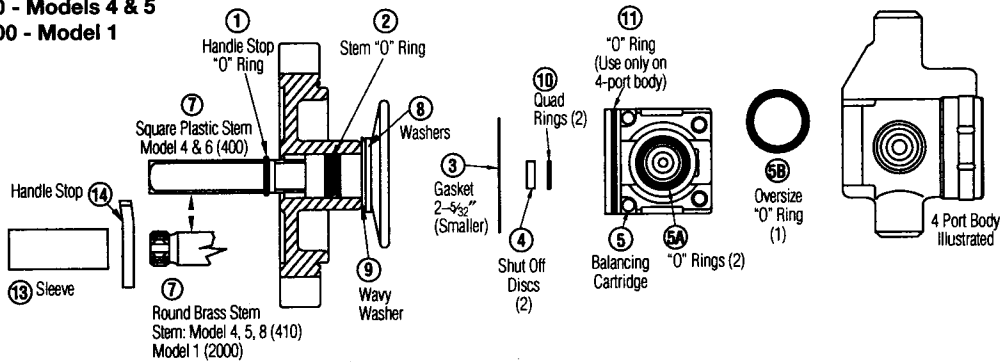
\*\* Use O-ring only on Hydroguard 412/414. Others use gasket.

\*\*\* Item 7 has brass stem and Celcon Plastic Mixing Plate (refer to Figures 4 and 4A).

**PLEASE NOTE:** Some kits contain parts for more than one model. Discard additional parts as appropriate.

## PARTS (CONTINUED)

**FIGURE 6:**  
**HYDROGUARD 400 - Models 4 & 6**  
**HYDROGUARD 410 - Models 4 & 5**  
**HYDROGUARD 2000 - Model 1**



Troubleshooting		Repair Kit No.	Where Used	Repair Kit Includes (Numbers below correspond with numbers in Figure 6 above)
1. Cartridge slips while seated in body. 2. Flow continues after mixer is turned off and all other seals have been replaced.	Oversize 410 Inlet Seal Kit*	410-570*	400/410 All Models	1-4, 5A, 5B*, 10, 11 Use item 11 only in Models 4-6, 4-port body (see Note 1 below)
1. Water leak at stem and/or bonnet. 2. Flow continues after mixer is turned off.	Gasket and Disc Replacement	410-182	400/410 All Models	1-4, 5A, 10, 11 Use item 11 only in Models 4-6, 4-port body (see Note 1 below)
1. Variable or untempered discharge temperature. 2. Leakage after mixed is turned off.	Balance Chamber	401-175 (for any 4-port valve)	400: Models 1-3 410: Models 1-3, 7, 8 Metal and Plastic Bonnet	3-5, 5A, 10, 11 Use item 11 only in Models 4-6, 4-port body (see Note 1 below)
		401-183 (for any 3-port valve)	410: Any 3-port valve	3-5, 5A, 11, 13, 15, 16** (refer to Fig. 5) (see Note 1 below)
1. Flow continues after mixer is turned off. 2. Handle splines on stem damaged.	Stem and Plate Replacement	410-176	400: Models 4-6	1-4, 7-9 Item 7 has square plastic stem and plate (see Note 2 below)
		410-378	410: All Models 2000: All Models	1-4, 7-9 Item 7 has round brass stem and plastic plate (refer to Fig. 3)

For parts not covered above, refer to Technical Instruction Form MV400, MV410 or TI410-5.

\* When using oversize O-ring (item 5B), discard ONE of the two regular sized O-rings (5A) normally used and use item 5B in its place.

\*\* Use O-ring only on Hydroguard 412/414. Others use gasket.

**Note 1:** O-ring, item 11, is used only in 4-port mixers.

**Note 2:** "C" on stem must face cold water inlet. For Model 4-400, you must also order new handle for new brass stem.

Order either lucite handle kit #410-383 or lever handle kit #410-384.

**PLEASE NOTE:** Some kits contain parts for more than one model. Discard additional parts as appropriate.

## MAXIMUM TEMPERATURE SETTING/HANDLE ROTATION STOP

### MAXIMUM TEMPERATURE SETTING (refer to Figure 7).

This must be set on the job and following any maintenance or servicing to the valve. Mixer is factory set to pass full HOT water.

- a. Loosen adjustment stop screw (do not remove). Gradually rotate stem counterclockwise to get desired maximum water temperature. (Maximum Temperature Stop will rotate long with the stem when the stem is rotated).
- b. Once stem has been rotated to desired temperature, slide adjustment stop clockwise until fin on adjustment stop touches the maximum temperature stop.
- c. While holding adjustment stop in place, tighten adjustment stop screw.
- d. Replace handle. Confirm maximum temperature has been set properly by operating the valve using the handle.

**CAUTION:** Adjustment stop must be present for proper operation.

FIGURE 7: Maximum Temperature Setting

