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**P O W**

**NO. 11 REGULATOR - SINGLE SEAT**

**SERVICING (Refer to figure 18)**

- I. Regulator does not shut off; check for:
  - A. Foreign material between the DISC (23) and the valve plug seat. Remove BONNET (20) (see Maintenance) and clean.
  - B. DISC (23) is worn. Replace DISC as described in Maintenance.
  - C. THERMAL SYSTEM (1) failure. See Thermal System Testing, Page 4.
  - D. Bulb installed in wrong position. See Installation, Page 3, for correct position.
  - E. PACKING GLAND ASSEMBLY (16) too tight locking VALVE STEM (29). Loosen PACKING GLAND ASSEMBLY (16) and lubricate.
  - F. Bent VALVE STEM (29). See Servicing, for replacement of stem
  - G. Valve improperly sized causing wire drawing and leakage.
  - H. Pressure differential is greater than allowable pressure drop. See Table 7.
  - I. TEMPERATURE ADJUSTING NUT ASSEMBLY (30) raised too high. See Temperature Adjustment,
- II. Erratic control of the regulator; check for:
  - A. PACKING GLAND ASSEMBLY (16) screwed too tight.
  - B. VALVE STEM (29) not lubricated. Tighten the nut on the STEM LUBRICATOR (13) or refill lubricator if empty. See Table 3.
  - C. Very wet steam. Install a high pressure steam trap just ahead of the regulator to drain off condensate that collects in the steam line.
  - D. Poor bulb location. Does not control actual temperature of water drawn from the tank.
  - E. Valve is opening or closing at the wrong temperature. See Temperature Adjustment,
  - F. Bent VALVE STEM (29). See Servicing, for replacement.
  - G. Valve improperly sized.
  - H. Faulty steam traps.

**POWERS PROCESS CONTROLS**

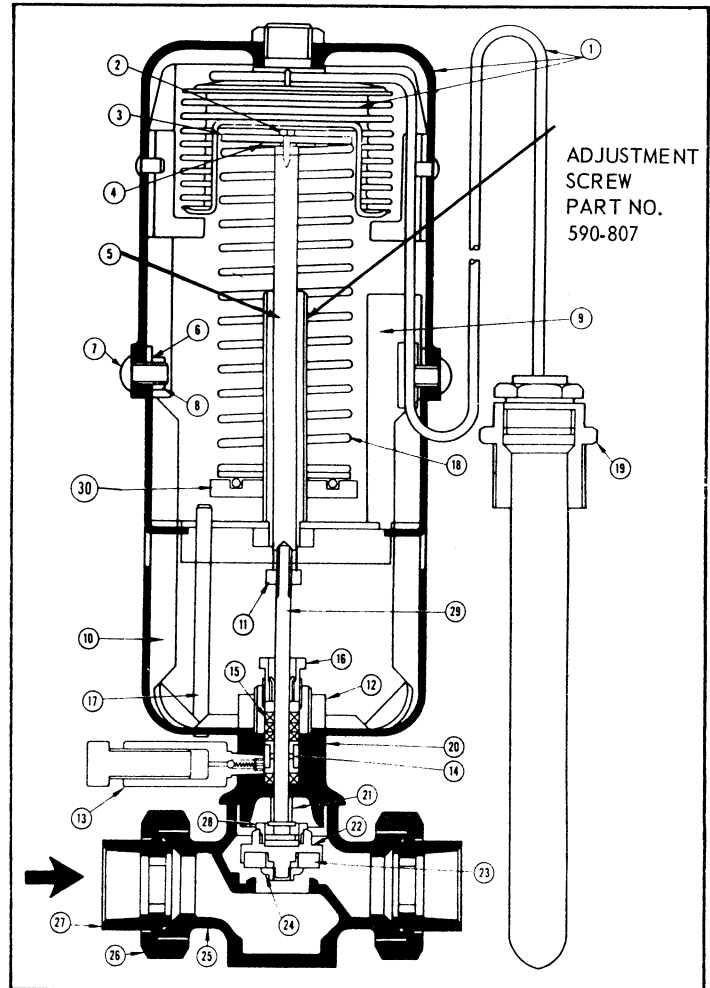


FIGURE 18

**III. Chattering of valve; check for:**

- A. Regulator installed with the flow of fluid in reverse of arrow on valve body.
- B. Pressure differential too high.
- C. Trapped condensate in line. Install a steam trap ahead of valve to drain condensate collecting in steam line.

**MATERIAL Parts common to all assemblies manufactured since April, 1959.**

Item	Description	Part No.	No. Req'd.	Material
*1	Thermal System	Refer to table 8		
2	Piston Plate Retaining Screw	590-816	1	St. Steel
3	Piston Plate Washer	590-815	1	Cad. Pl. Stl.
4	Spring Guide Washer	590-814 ***	1	Cad. Pl. Stl.
5	Stem Extension	590-808A	1	Brass
6	Lock Washer	046-017K	2	Cad. Pl. Stl.
7	5/16-18 x 5/8 Rd. Hd. Mach. Screw	030-546J	2	Zinc Pl. Stl.
8	5/16-18 x 3/16 Hex Nut	041-225K	2	Cad. Pl. Stl.
9	Temp. Adj. Setting Scale	590-813	1	Aluminum
10	Yoke and Bridge Assembly	590-859	1	-
11	1/4-28 x 3/16 Hex Nut	041-125	1	Brass
12	Lock Nut	628-008	1	Brass
†13	Stem Lubricator Assembly**	590-184A	1	-
14	Packing Spacer	590-766	1	Brass
15	Packing Ring	590-590	4	Asbestos & Teflon
16	Packing Gland Assembly	590-763	1	Brass
17	Temp. Adj. Rod	590-820	1	Cad. Pl. Stl.
19	1" Tank Fitting	705-005	1	Brass
30	Temp. Adj. Nut Assembly	590-829	1	-

\*Includes bulb, capillary, housing & bellows  
 \*\*Available as an accessory only  
 †Refill lubricant, Part No. 590-165A  
 \*\*\*Use 595-503 with Dual Springs

Table 3

**MATERIAL With reference to valve size**

Item	Description	Valve Sizes					No. Req'd.	Material
		1/2"	3/4"	1"	1-1/4"	1-1/2"		
18	Spring *	590-821	590-821	590-137	590-140	590-143	1	Cad. Stl.
20	Bonnet	590-131	590-134	601-010	609-021	609-009	1	Brass
21	Stop Sleeve	609-019C	609-019B	601-010	609-021	609-009	1	Brass
22	Disc Holder	590-756	653-002	653-002	653-004	653-005	1	Brass
23	Disc	653-160	653-161	653-162	653-163	653-164	1	-
24	Disc Retainer Nut	041-092	654-009	654-010	654-011	-	1	Brass
25	Valve Body	601-016	590-668	590-670	591-701	590-683	1	Bronze
26	Union Nut	601-004	602-004	609-004	610-004	611-004	2	Bronze
27	Union Tail Piece	601-005	602-005	609-003	610-003	611-003	2	Brass
28	Stem Retainer	654-016	654-017	654-017	654-019	654-019	1	Brass
29	Stem Assembly	591-815A	591-819	591-819	591-818	591-818A	1	-
-	Lower Housing Assembly Includes items: 2 thru 18 and 20 thru 29	590-860	590-851	590-862	590-863	590-864	-	-

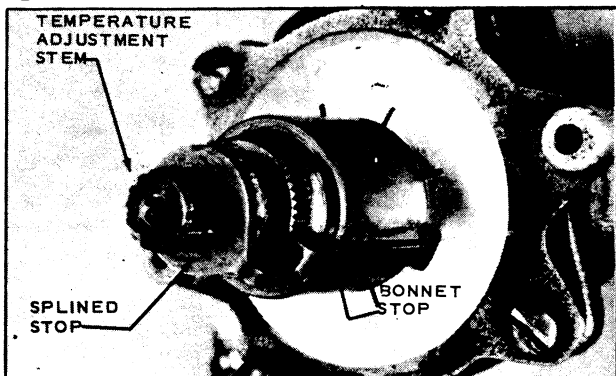
\*1/2" and 3/4" valves have round wire springs, 1" to 1-1/2" valves have dual springs (inner & outer).  
 Inner spring is 595-501, outer spring is 595-502.

Table 4

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**POWERS**  
**PROCESS CONTROLS**  
 A UNIT OF MARK CONTROLS CORPORATION

**7 MAXIMUM TEMPERATURE SETTING**

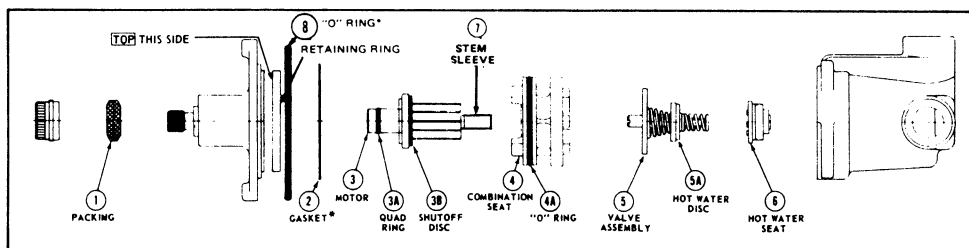


Factory set at 115°F (46°C). To change setting, remove splined stop. Rotate temperature adjustment stem to required maximum setting and replace splined stop. Shutoff is made by rotating temperature adjustment stem clockwise. Handle holds splined stop in position.

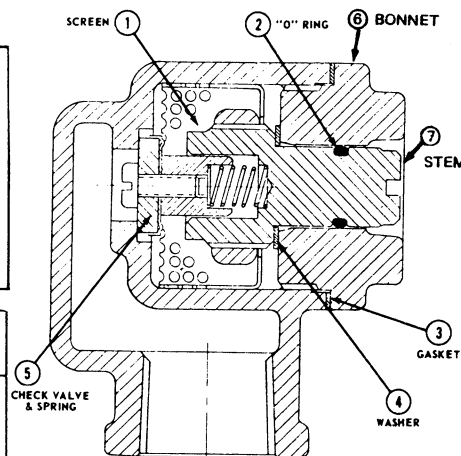
*Caution: Resetting of the splined stop can result in temperatures higher than 115°F. (46°C).*

**VALVE REPLACEMENT KITS**

**1/2" POWERS COMBINATION STRAINER-CHECKSTOPS**



\*Use either Item 2 or 8 depending on the existing bonnet seal.



TROUBLE SHOOTING		Recommended Repair Kit
<b>GASKET AND DISC REPLACEMENT</b>	1. Water leak at stem and/or bonnet (Item 1 for models 4, 5, 6 & 7) 2. Flow of water continues after mixer turns off	<b>227-338</b> Includes items: 1, 2, 3A, 3B, 4A, & 8
<b>MOTOR REPLACEMENT</b>	3. Variable or untempered discharge temperature	(40-90°F) <b>227-343</b> (65-115°F) <b>227-339</b> (120-175°F) <b>227-342</b> Includes items: 2, 3, 3A, 3B, 7 & 8
<b>VALVE AND HOT WATER SEAT REPLACEMENT</b>	4. Flow of water continues after mixer is turned off due to worn hot water seat (6) 5. Variable discharge temperature continues after replacement of motor (3)	<b>227-290</b> (Models 1, 2, 3 & 4) Includes items 2, 4A, 5, 6 and 7 <b>227-340</b> (Models 5, 6 & 7) Includes items 2, 4A, 5, 6, 7 & 8
<b>COMBINATION SEAT REPLACEMENT (STD. CAPACITY)</b>	6. Flow of water continues after mixer is turned off and shutoff disc (3B) and/or hot water seat (6) has been replaced	<b>227-341</b> Includes items: 2, 4, 4A & 8
<b>HIGH CAPACITY KIT</b>	7. To increase capacity of mixer to 9.0 G.P.M. @ 45 P.S.I. diff.	<b>227-431</b> (Models 5, 6, & 7) Includes items 2, 4, 4A, 5, 6 & 8
<b>LOW CAPACITY KIT</b>	8. To decrease capacity of mixer to 1.0 G.P.M. @ 45 P.S.I. diff.	<b>227-445</b> (Models 5, 6, & 7) Includes items 2, 4, 4A, 5, 6 & 8
<b>110° CONVERSION KIT</b>	9. Permits discharge temperature to be within 2°F of hot water supply.	<b>420-203</b> Includes items 2, 4, 4A, 5, 6 & 8

To clean the screens (1), shut off both supplies by turning the stem (7) clockwise to a solid stop. Remove the bonnet (6) by turning counterclockwise. Pull out screen (1) and clean. After replacing the screen (1) and bonnet (7) be sure to open the stop valves by turning the stem (8) completely counterclockwise.

To inspect or replace the check valve or spring (5), the water must be shut off at some other point. Remove the bonnet (6) and then the stem (7). Replace in reverse order.

- To replace strainers, use Repair Kit 230-133 (Includes items 1, 2, 3 and 4)
- To replace check valve, use Repair Kit 230-132 (Includes items 2, 3, 4 and 5)
- To replace gaskets, use Repair Kit 230-131 (Includes items 2, 3, and 4)

NOTE: Each repair kit contains parts for one pair.