

MAINTENANCE PROCEDURE TP-1

REPLACING THE THERMOSTATIC ELEMENT TRAC Style 'P' Temperature Regulators

When a thermostatic element (thermostat) has lost its thermal charge, it would be demonstrated by the system overheating. The failsafe controller would shut steam flow through the valve when the system reached the controller's set temperature. Essentially the failsafe controller would be regulating steam flow to a wide open regulator and process water temperatures would fluctuate erratically.

If the valve fails to respond to temperature changes at the thermo. bulb (within the range stamped on the nameplate) and adjustments made using the temperature adjusting wheel have no effect on process temperature, first follow the troubleshooting checks outlined in technical manual P-EFS-1 section "If the System Overheats" to check for bypass valve seat tightness, and leaks at the pilot valve seat or main valve seat. If no leaks are found, the cause is a failed thermostatic element. A "dead" element is not repairable and must be replaced.

In most cases the thermostatic element can be replaced with the valve remaining in the pipeline. The valve needs to be removed only when access to the bellows housing is limited or ship procedures require the unit control temperature to be set at another location.

INSTALLATION

Once it has been determined that the thermostatic element must be replaced, several important steps must be followed in sequence:

Refer to Figure 1, Temperature Pilot.

1. Shut off steam supply to the temperature regulating valve and relieve any pressure from the upstream pipe line. The bulb is installed in a process loop separate from the temperature regulating valve, therefore the technician must also shut off water supply to the process loop.

Tag the steam supply and temperature regulating valve OUT OF SERVICE according to ship's procedures.

2. Loosen Set Screw (3) and unscrew the Temperature Adjustment Wheel (2) by HAND ONLY, (never use a wrench) to remove the Temperature Adjustment Wheel (2) and Thermostatic Element (1) from the Regulator.

NOTE: Before attempting to install a new thermostat, the bulb of the Thermostatic Element (1) must be maintained at or below the lowest set temperature of the range indicated on the Nameplate to properly set Pilot Valve Stem. Depending on the temperature range of the Element this can be achieved by the ambient temperature or by immersing the bulb in a temperature controlled water bath.

3. Loosen Set Screw (3) on the Adjustment Wheel (2) of the new thermostatic element. Screw the Thermostatic Element (1) and Temperature Adjustment Wheel (2) on to the Pilot Valve Bonnet (7). Turn Adjustment Wheel (2) down by HAND ONLY, (never use a wrench) until there is about 1/16" clearance from the bottom of the Adjusting Wheel (2) and the shoulder of the Pilot Valve Bonnet (7).

NOTE: If the technician feels resistance when turning the Adjustment Wheel (2) down, The Pilot Valve Stem (16) may be making contact with the Pilot Valve Seat (22). Before proceeding, use a 7/16" open end wrench to hold the OHP Spring Retainer (8) and a pair of needle nose pliers to loosen the Pilot Valve Stem Locknut (15). Spin the Pilot Valve Stem Locknut (15) down to the bottom of the threaded portion of Pilot Valve Stem (16). Screw the Pilot Valve Stem (16) into the OHP Spring Retainer (8) until you can turn Adjustment Wheel (2) down by HAND ONLY, (never use a wrench) until there is about 1/16" clearance from the bottom of the Adjusting Wheel (2) and the shoulder of the Pilot Valve Bonnet (7). If there is no resistance, proceed to step 4.

4. Use a 7/16" open end wrench to hold the OHP Spring Retainer (8) and a pair of needle nose pliers to loosen the Pilot Valve Stem Locknut (15). Spin the Pilot Valve Stem Locknut (15) down to the bottom of the threaded portion of Pilot Valve Stem (16).
5. Screw the Pilot Valve Stem (16) down until it makes positive contact with the Pilot Valve Seat (22). Use a 7/16" open end wrench to hold the OHP Spring Retainer (8) and a pair of needle nose pliers to tighten the Pilot Valve Stem Locknut (15) against the OHP Spring Retainer (without rotating the Pilot Valve Stem).

NOTE: Do not twist the capillary or make any sharp bends in the capillary. Any leakage of liquid from the thermal element assembly will render it inoperative.

6. Install the thermostatic element in the heater connection marked "thermostat".

ADJUSTMENT

Refer to Figure 1, Temperature Pilot.

1. Verify that the steam supply to the temperature regulating valve is shut off and relieve any pressure from the upstream pipe line.
2. Verify that the temperature adjustment is in the manual lockdown position: Loosen Set Screw (3) and turn Adjustment Wheel (2) down by HAND ONLY (never use a wrench) until the Pilot Valve Stem (16) seats (when the Adjustment Wheel (2) becomes harder to turn by hand).
3. Slowly open all steam shutoff valves (not the bypass valve), so that you have steam to the Regulator.
4. Slowly open a hot water faucet or faucets to insure a flow of water through the Heater. Ideally, a water flow of 10% to 25% of Heater rating is desirable for adjusting the Pilot.
5. Back off the Adjustment Wheel (2) until the Regulator valve opens (when you hear a flow of steam through the Regulator).
6. Wait until the temperature at the Heater hot water outlet stabilizes at one steady reading. It may be necessary to adjust the Adjustment Wheel (2) a small amount (one full turn will change the water outlet temperature approximately 20°F) to obtain the desired hot water temperature at the Heater outlet, as follows:

If the temperature is too low, back off (turn counterclockwise) the Adjustment Wheel (2).

If the temperature is too high, turn down (clockwise) the Adjustment Wheel (2).

Wait after each adjustment until the temperature becomes steady again before making another adjustment.

7. When the Heater outlet holds steady at the desired temperature, tighten Set Screw (3) against the Pilot Valve Bonnet (7) to hold the Adjustment Wheel (2) in place.
8. Observe the operation of the Heater under various changes in hot water flow. If the Regulator holds the Heater outlet temperature relatively steady, (as flow changes occur) no further adjustments are necessary.

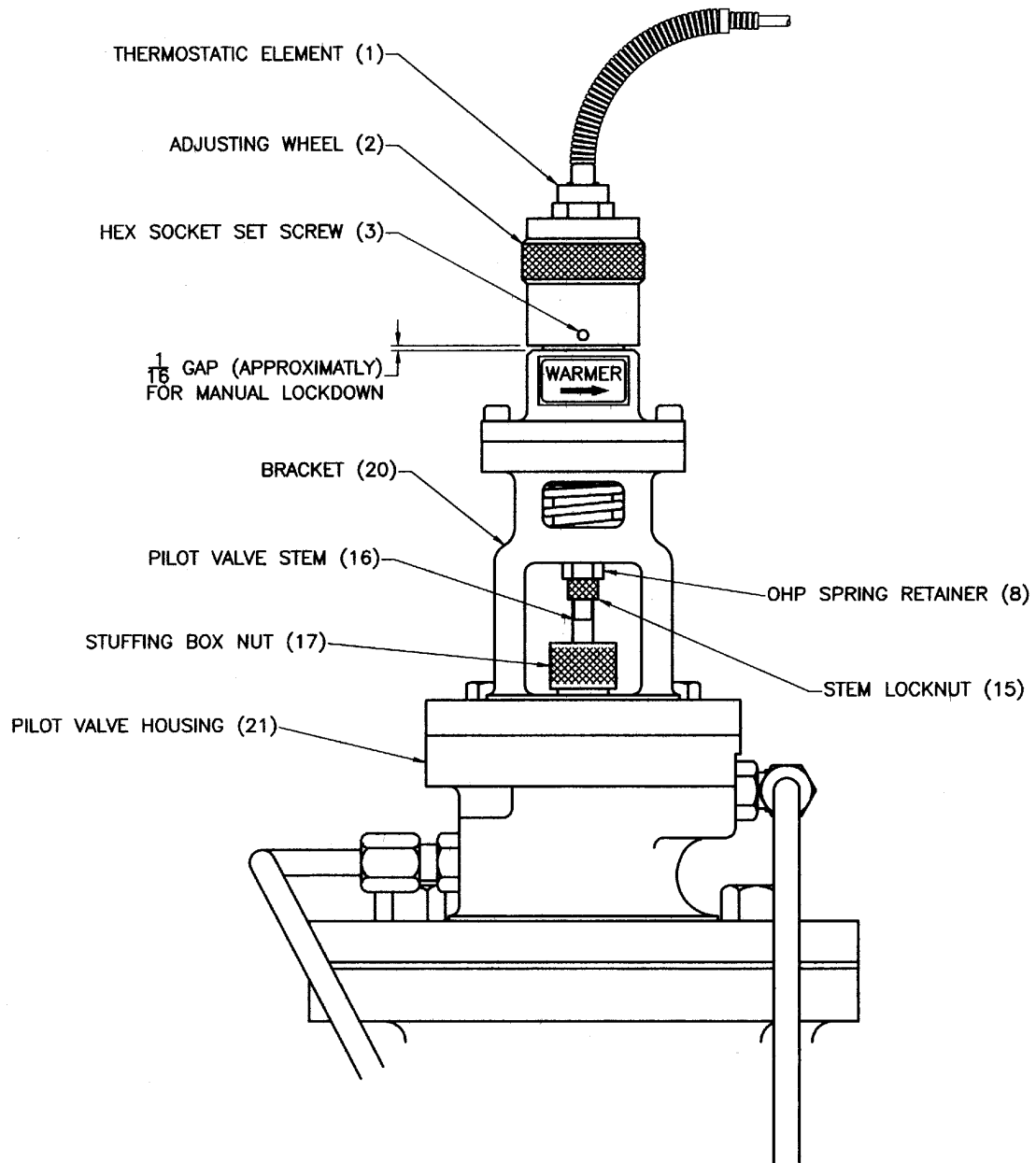


Figure 1 Pilot Assembly – Temperature Adjustment