

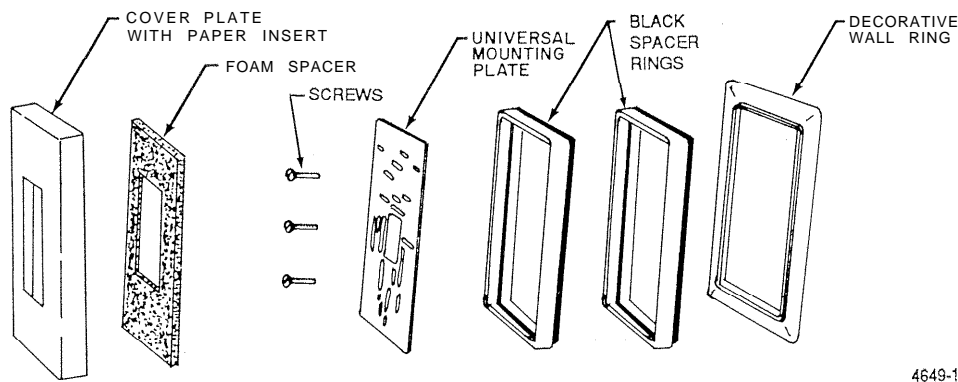
# 14002573-001 HP970 Humidistat and TP970 Thermostat Modernization Kit

REPLACEMENT DATA

## GENERAL

This Modernization Kit contains the parts required to convert fittings for one- and two-pipe thermostats and humidistats to

accept TP970 Thermostats and HP970 Humidistats (Fig. 1). The Humidistat/Thermostat and cover are ordered separately.



4649-1

Fig. 1. Modernization kit parts.

## APPLICATION

Table 1 lists which Honeywell Humidistat/Thermostat to use as a replacement and which figure to refer to for replacement procedures.

Table 1. Humidistat/thermostat replacement and figure number cross-reference.

Change		Number of Pipes	Fig. No.
From	To		
Barber-Colman TK1001	TP970A	2	4
Barber-Colman TK1101	TP970B,C,D	2	4
Barber-Colman TK1201	TP972A	2	4
Honeywell HP901A	HP970A	1	10
Honeywell HP900A	HP971A	1	7
Honeywell HP900B	HP970B HP972B	1	7
Honeywell TO400	TP973	1	9
Honeywell TP900A	TP970A,C	2	7
Honeywell TP900B	TP971A,B	2	7
Honeywell TP900D	TP972A	2	7
Honeywell TP901A	TP970A,C	2	8



Table 1. Humidistat/thermostat replacement and figure number cross-reference. (continued)

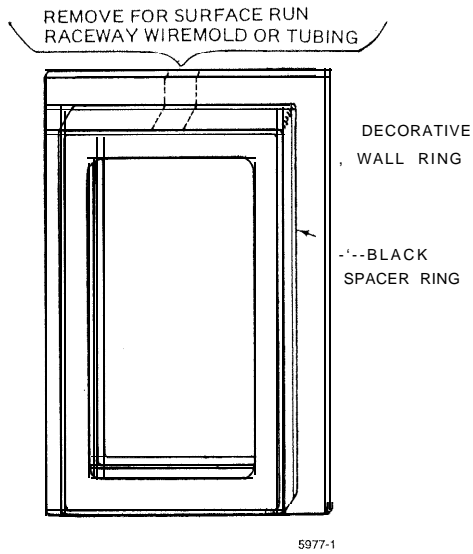
Change		Number of Pipes	Fig. No.
From	To		
Honeywell TP901B	TP970B,D	2	8
Honeywell TP901C	TP973A	1	9
Honeywell TP910A	TP970A,C	2	10
Honeywell TP910B	TP970B,D	2	10
Honeywell TP911A	TP971A	2	10
Honeywell TP913A,C,D	TP972A	2	10
Honeywell TP923A	TP973A	1	10
Honeywell TP923B	TP973B	1	10
Honeywell TP924A	TP974A	1	10
Honeywell TP931B <sup>1</sup>	TP970A,C TP972A	2	11
Johnson T400	TP970A,B,C	2	5
Johnson 4000 Series	TP970	2	6
Johnson H102	HP972B	2	5
Johnson H103	HP972B	2	6
Johnson H4100	HP972B	2	12
Powers 190	HP972B	2	13
Powers HU186	HP972B	2	12
Powers HS & D	TP970A,C	2	13
Powers T21	TP970A,B,C,D TP971A TP972A	2	14
Powers TH180	TP970A,B,C, TP973A,B	2	
Robertshaw T10	TP970A,B,C,D TP973A,B		15, 16, 17
Robertshaw T20	TP971A,B		15, 16, 17
Robertshaw T30,T31	TP972A		15, 16, 17
Robertshaw T50	TP974		15, 16, 17
Robertshaw H10	HP972B		15, 16, 17

<sup>1</sup>The TP931 mullion application does not require the Modernization Kit.

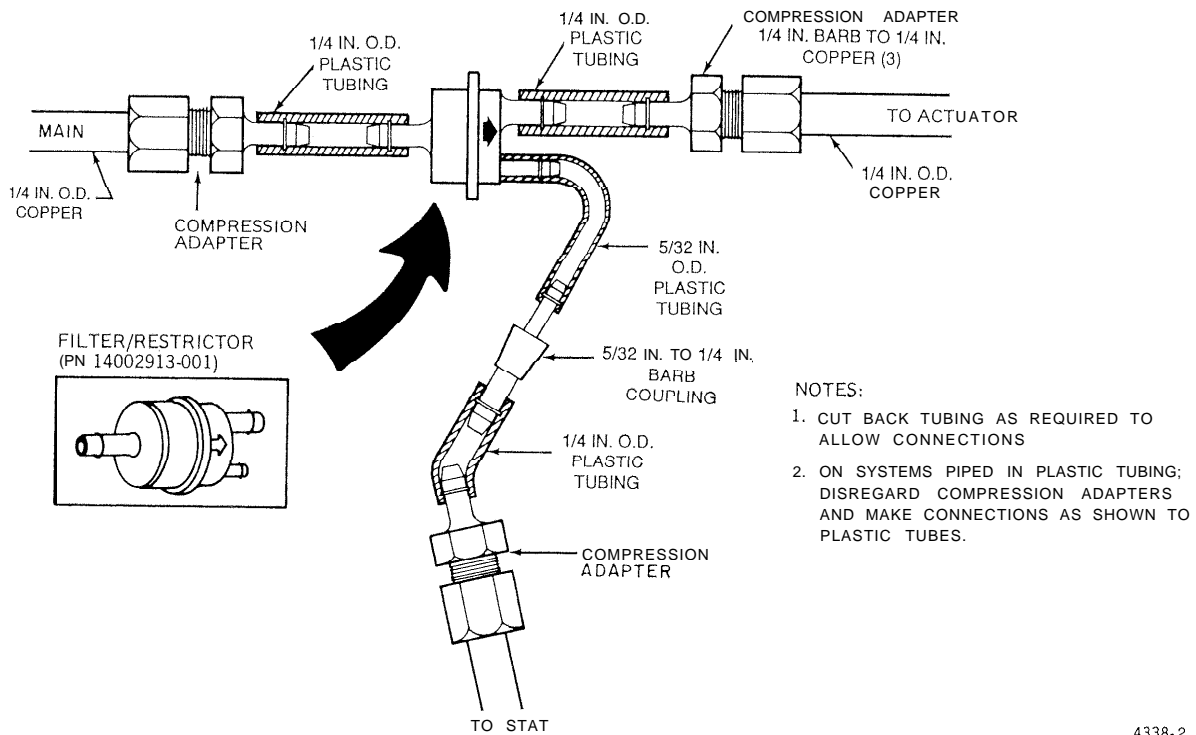
## INSTALLATION

### NOTES:

1. This Kit contains more parts than will be used on any installation. Discard unused parts.
2. Do not remove the antikink springs from the cut tubing.
3. If the pneumatic tubing is surface run, cut away a portion of the decorative wall ring and spacer ring. (Fig. 2).
4. When replacing a one-pipe device, the restrictor must be replaced with Restrictor 14002913-001 (Fig. 3).
5. The same general installation procedure applies for all conversions.



**Fig. 2. Decorative wall ring and black spacer ring modification for surface run tubing.**



**Fig. 3. New restrictor installation in 1/4-in. copper tubing.**

## Prepare Location For Humidistat/ Thermostat

- ❶ Remove and discard the old Thermostat/Humidistat and rings.
- ❷ Remove the tubing from the fitting.
- ❸ Clean the fitting, if required.
- ❹ Determine the appropriate installation figure number reference from Table 1.
- ❺ Identify and install the correct mounting parts according to the figure number determined in Step 4.

NOTE: The cream-colored paper insert can be painted to match the wall or be used as a template to cut wallpaper.

## Install Humidistat/Thermostat

- ❶ Feed the tubing through the mounting parts.
- ❷ Attach the tubing to the Humidistat/Thermostat backplate.
- ❸ Attach the backplate using the screws furnished with the Humidistat/Thermostat.
- ❹ Remove any shipping stops and press the Humidistat/Thermostat onto the backplate until the retaining clips on the backplate engage.
- ❺ Proceed to HUMIDISTAT CALIBRATION or THERMOSTAT CALIBRATION.

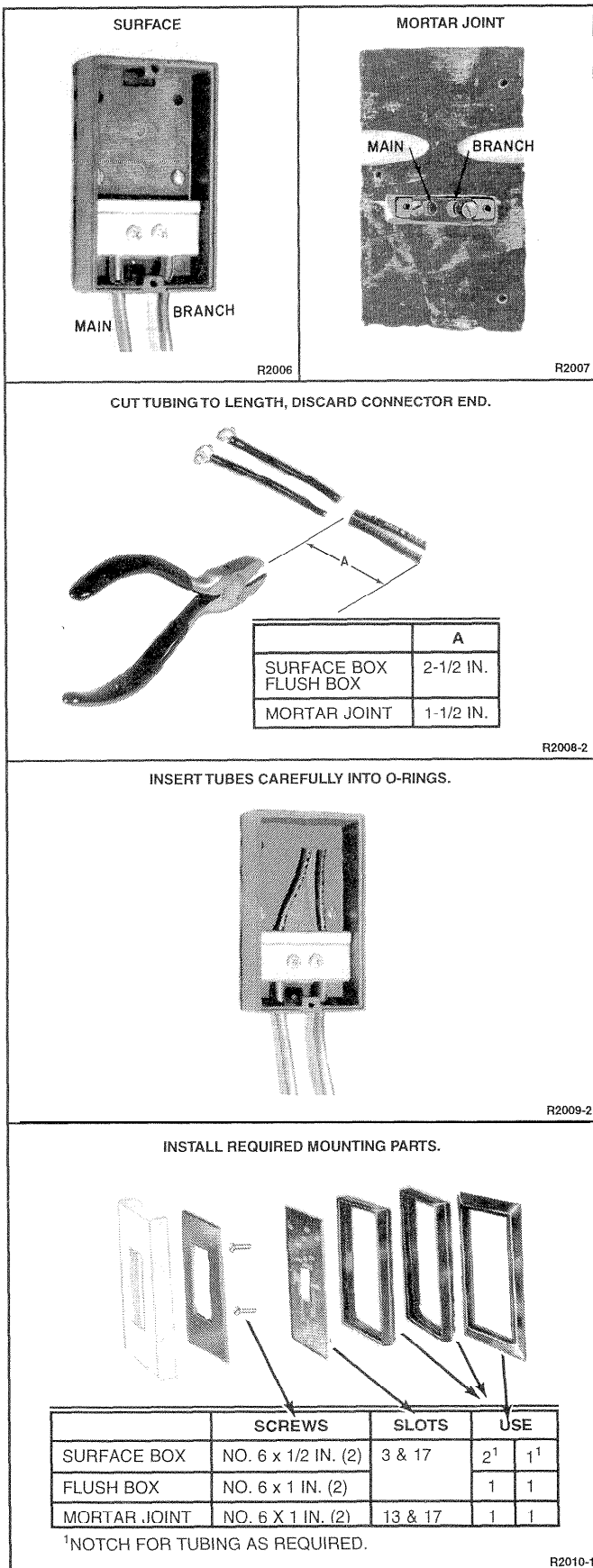


Fig. 4. Barber-Colman TK1001, 1101, and 1201 replacement.

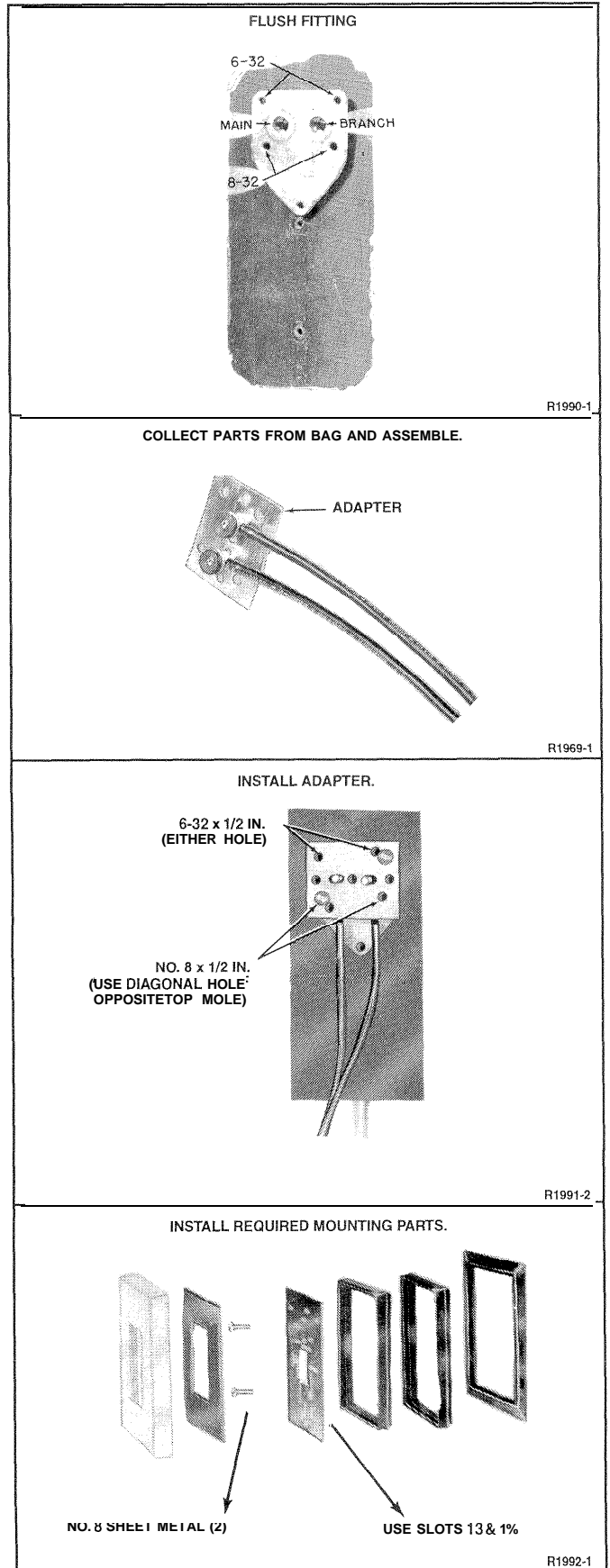


Fig. 5. Johnson T400, H102, and H103 replacement.

**FLUSH BOX**

R1993

**SURFACE FITTING**

R1994

COLLECT PARTS FROM BAG AND ASSEMBLE.

ADAPTER

R1983-2

INSERT ADAPTER.

NO. 6 X 1/2

R1995-1

INSTALL REQUIRED MOUNTING PARTS.

	SCREWS	SLOTS	USE	
MORTAR JOINT	NO. 6 x 1-1/2 IN. (2)	13 & 11	2	1
FLUSH BOX	NO. 6 x 1 IN. (2)	OR 9 & 16	1	1
SURFACE BOX	NO. SHEET METAL (3)	5, 13 & 15	2 <sup>1</sup>	1 <sup>1</sup>

<sup>1</sup>NOTCH FOR TUBING AS REQUIRED.

R1996-1

**SURFACE BOX**

R1960

**FLUSH BOX**

R1958-1

COLLECT PARTS FROM BAG AND ASSEMBLE.

T900 2-PIPE

HP900 1-PIPE

R1959-1

INSTALL ADAPTER.

NO. 6 X 1/2 IN. (2)  
NO. 6 WASHER (2)  
SPACER (2)

R1960-2

INSTALL REQUIRED MOUNTING PARTS.

	SCREWS	SLOTS	USE
FLUSH BOX	NO. 6 x 1-1/2 IN. (2)	2 & 19	1
SURFACE BOX	NO. 6 x 1 IN. (2)		0

R1961-1

Fig. 6. Johnson 4000 series and H4100 replacement.

Fig. 7. Honeywell TP900A, B, D and HP900A, B replacement.

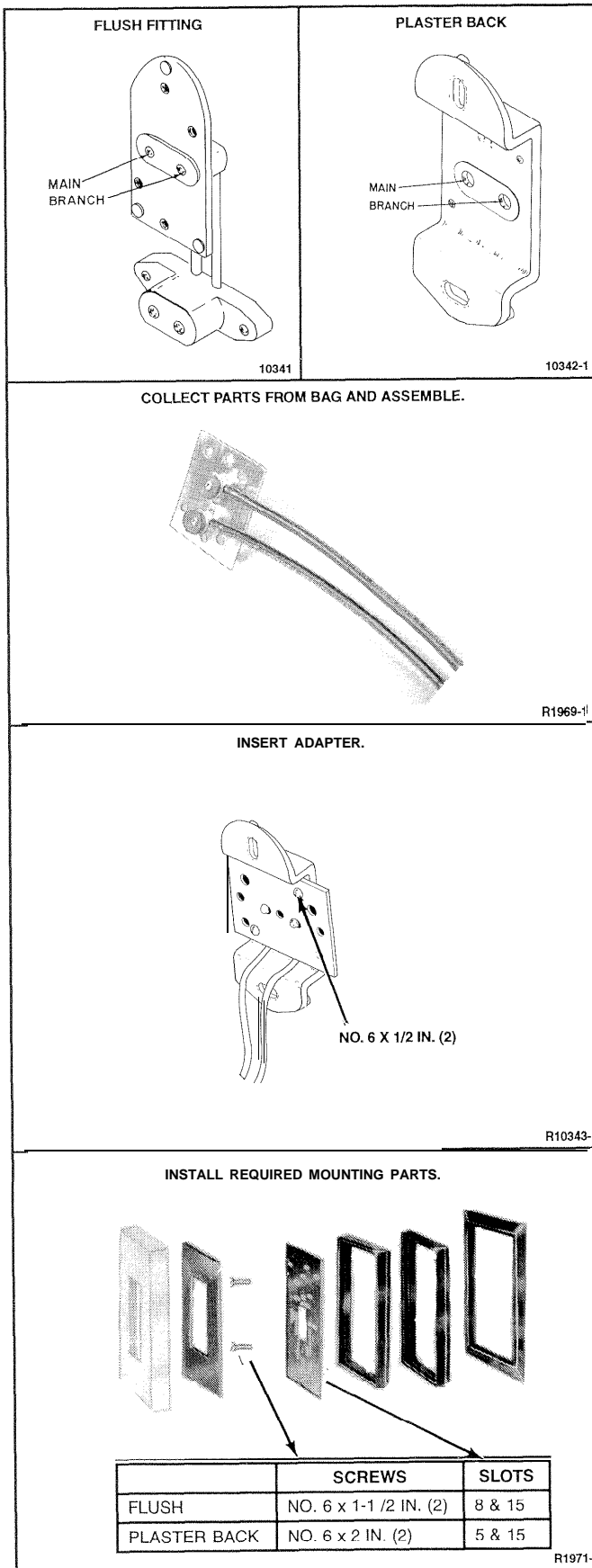


Fig. 8. Honeywell TP901 A, B replacement.

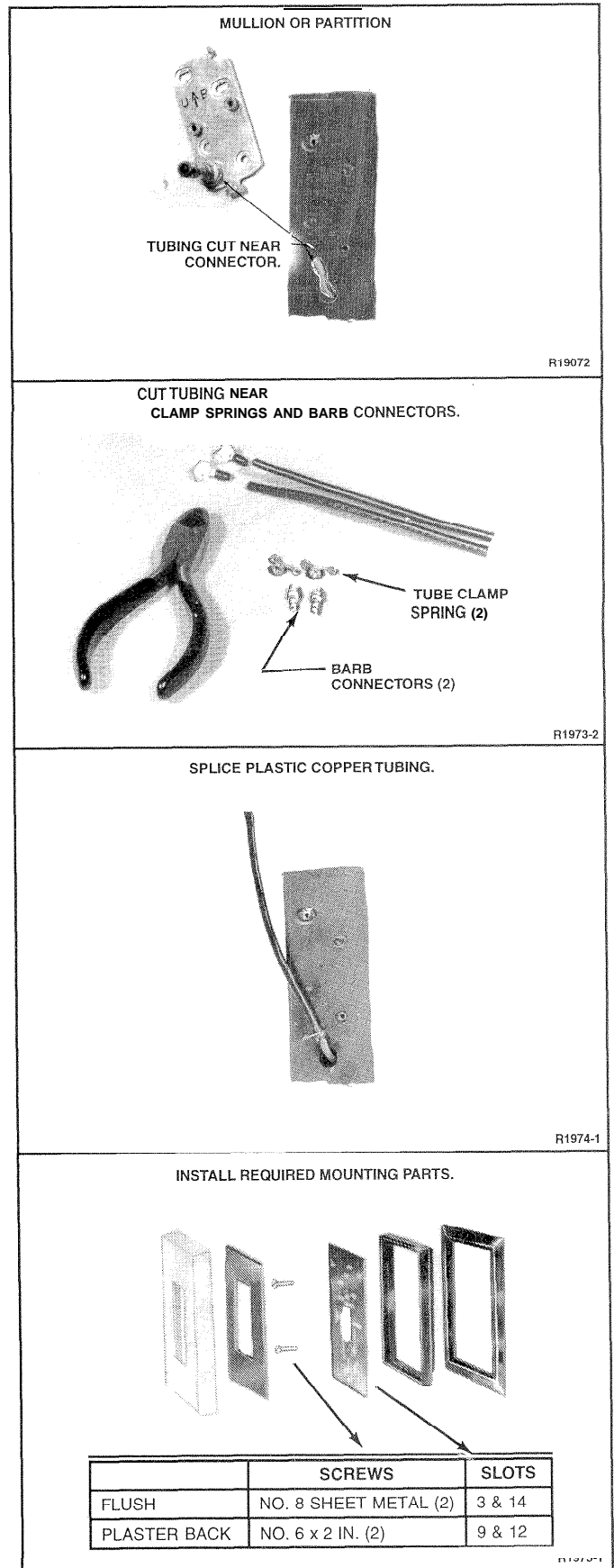
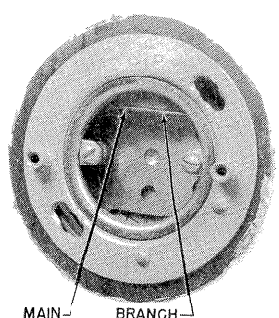


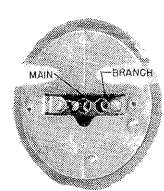
Fig. 9. Honeywell T P901C and TO400 replacement

**FLUSH BANJO**



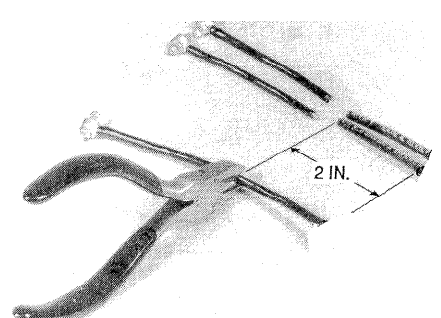
R1982

**MORTAR JOINT**



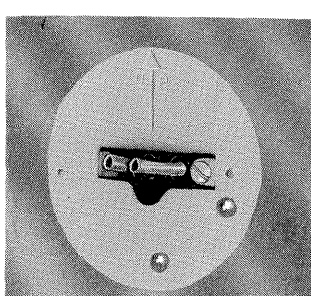
R1963

**COLLECT 1 OR 2 PIPE AIR HEAD, CUT TO LENGTH, AND DISCARD CONNECTOR END.**



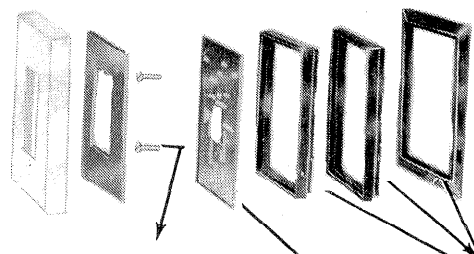
R1964-1

**INSERT TUBING CAREFULLY INTO O-RINGS, USE NEW O-RINGS FROM BAG ASSEMBLY ONLY IF NECESSARY.**



R1965-1

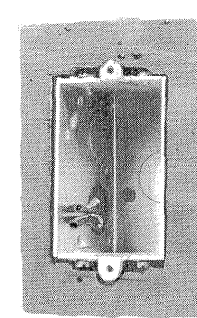
**INSTALL REQUIRED MOUNTING PARTS.**



	SCREWS	SLOTS	USE	
FLUSH BANJO	NO. 6 x 1/2 IN. (2)	13 & 10 OR	0	1
SURFACE BANJO	NO. 6 x 1 IN. (2)	13 & 12	2 <sup>1</sup>	1 <sup>1</sup>
MORTAR JOINT	NO. 6 x 1/2 IN. (2)		0	1

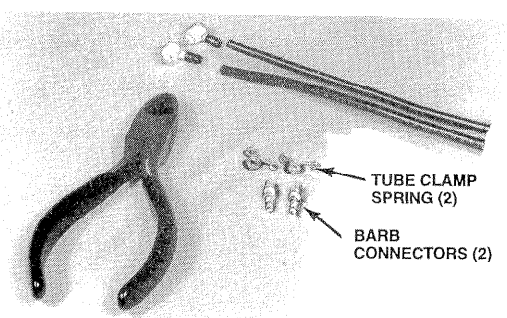
\*NOTCH FOR TUBING AS REQUIRED.

**FLUSH ELECTRICAL BOX**



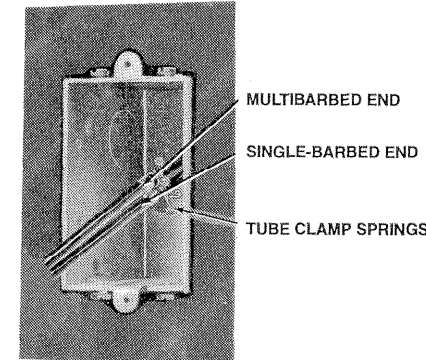
R1976

**CUT TUBING NEAR CONNECTOR. LOCATE TUBE CLAMP SPRINGS AND BARB CONNECTORS.**



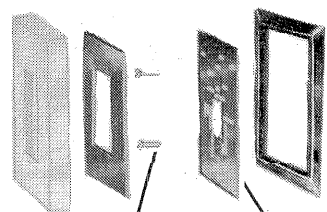
R1973-2

**SPLICE PLASTIC TUBING.**



R1977-2

**INSTALL REQUIRED MOUNTING PARTS.**



NO. 6 x 1 IN. (2)      USE SLOTS 3 & 17

R1978-1

Fig. 10. Honeywell TP910A, B, TP911A, TP913, TP923A, B, TP924, and HP901A replacement.

Fig. 11. Honeywell TP931B replacement.



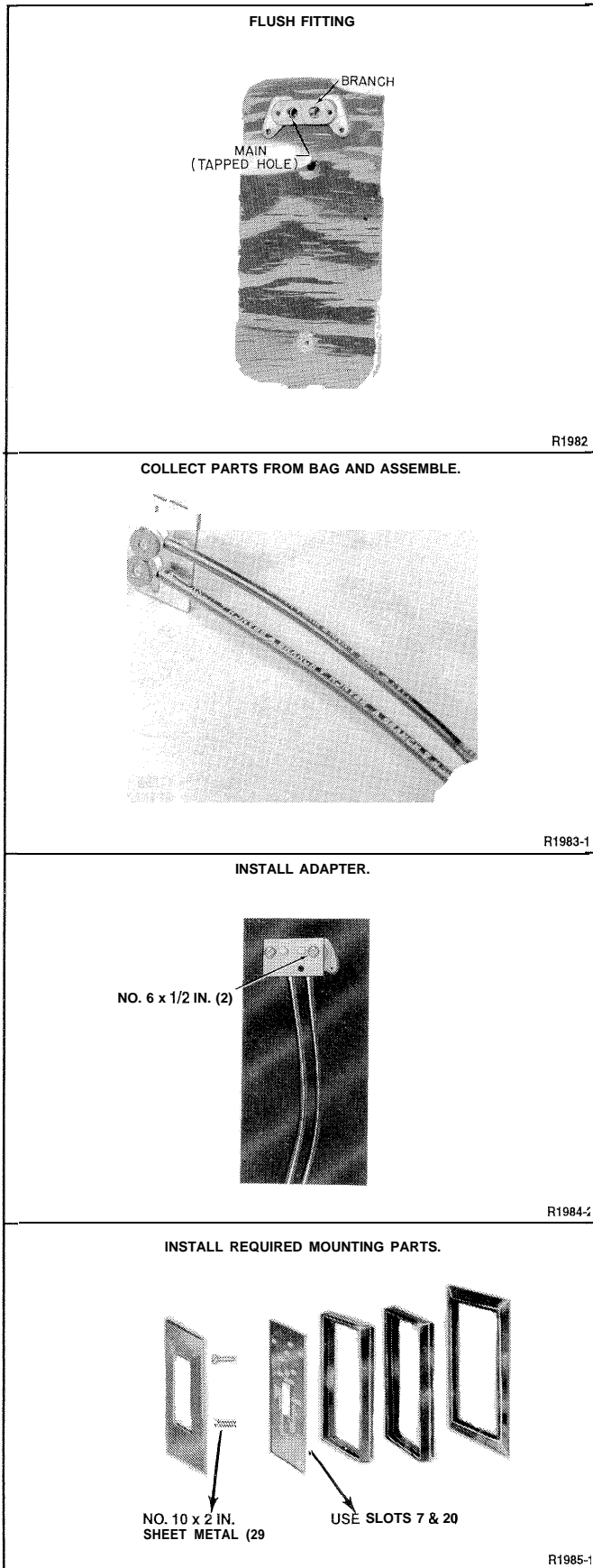


Fig. 12. Powers 190 and HS & 6) replacement.

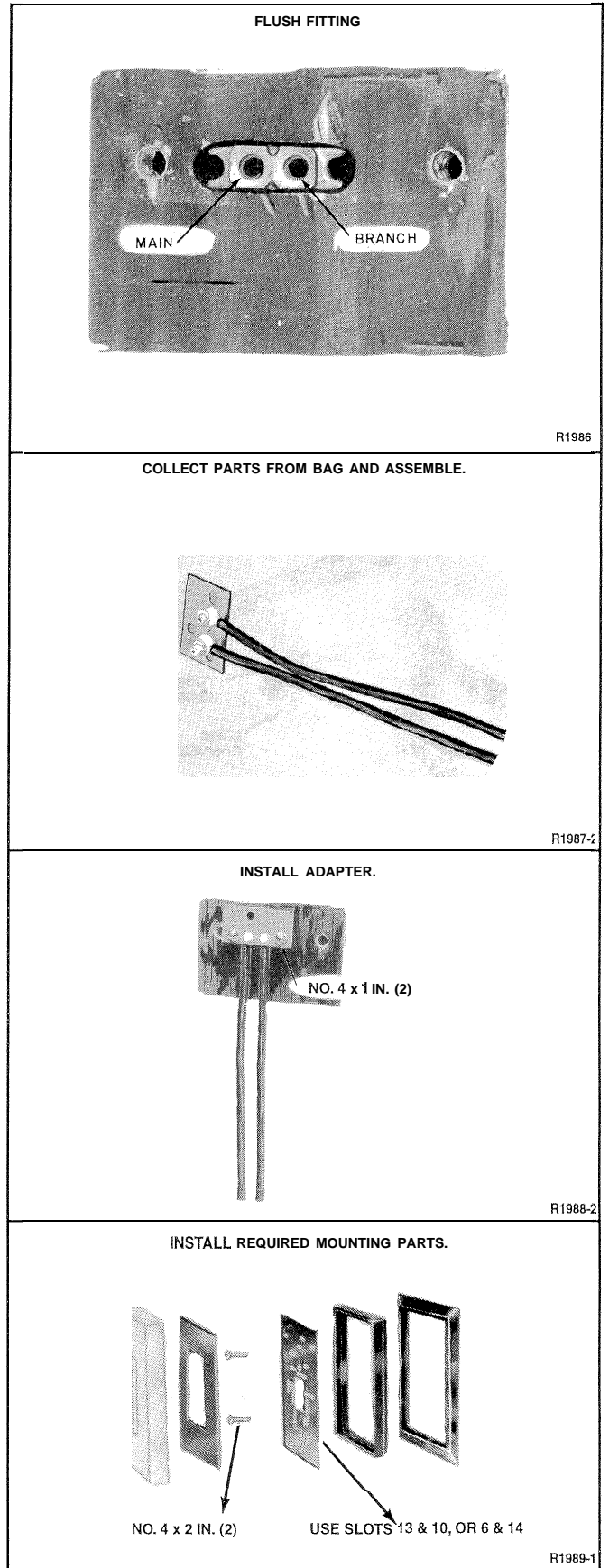
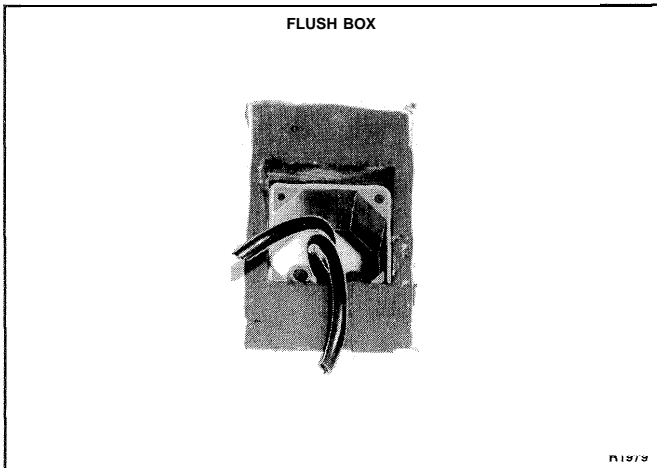


Fig. 13. Powers HU186 and T21 replacement.

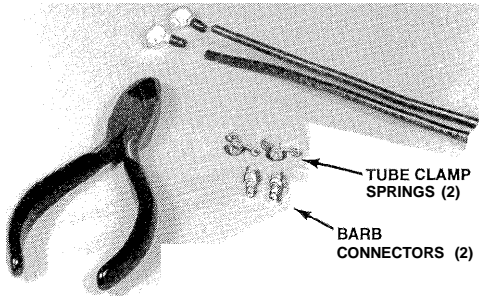


R1973



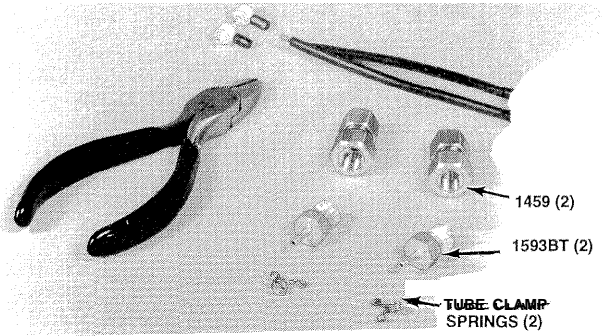
R2002

CUT TUBING NEAR CONNECTOR. LOCATE TUBE CLAMP SPRINGS AND BARB CONNECTORS.



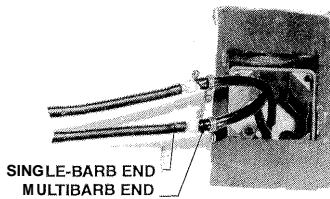
R1973-2

CUT TUBING NEAR CONNECTOR, LOCATE TUBE CLAMP SPRINGS. NOTE: WAREHOUSE PARTS 1459 AND 1593BT ORDERED SEPARATELY.



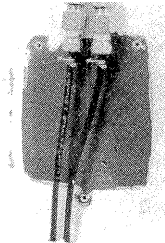
R2003-3

SPlice PLASTIC TUBING.



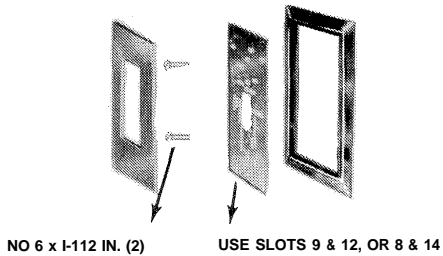
R1980-1

SPlice PLASTIC TUBING TO COPPERTUBING WITH WAREHOUSE ADAPTERS.



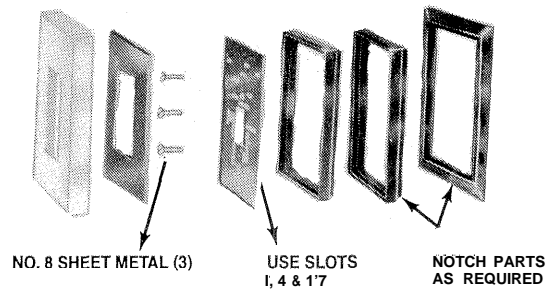
R2004-1

INSTALL REQUIRED MOUNTING PARTS.



R1981-1

INSTALL REQUIRED MOUNTING PARTS.



R2005-1

Fig. 14. Powers TH180 replacement.

Fig. 15. Robertshaw T10, T20, T30, T50, and H10 replacement—surface mounting.

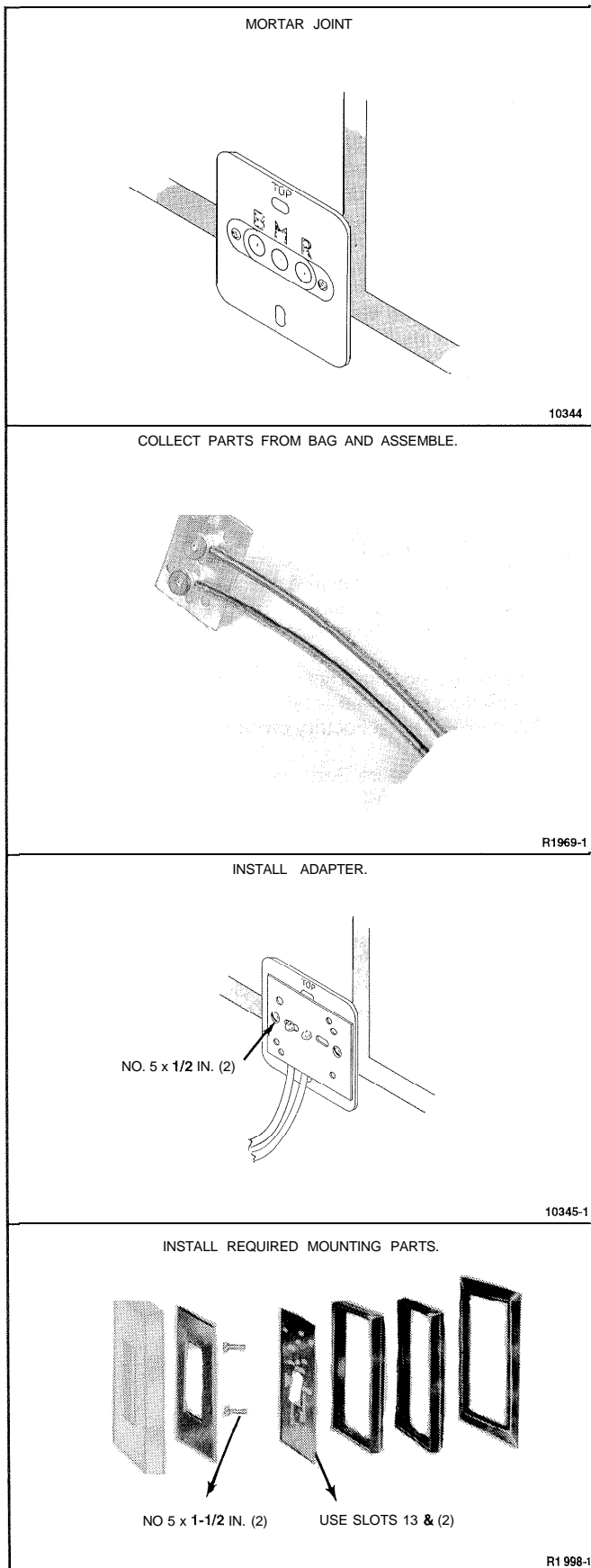


Fig. 16. Robertshaw T10, T20, T30, T50, and H10 replacement-mortar joint mounting.

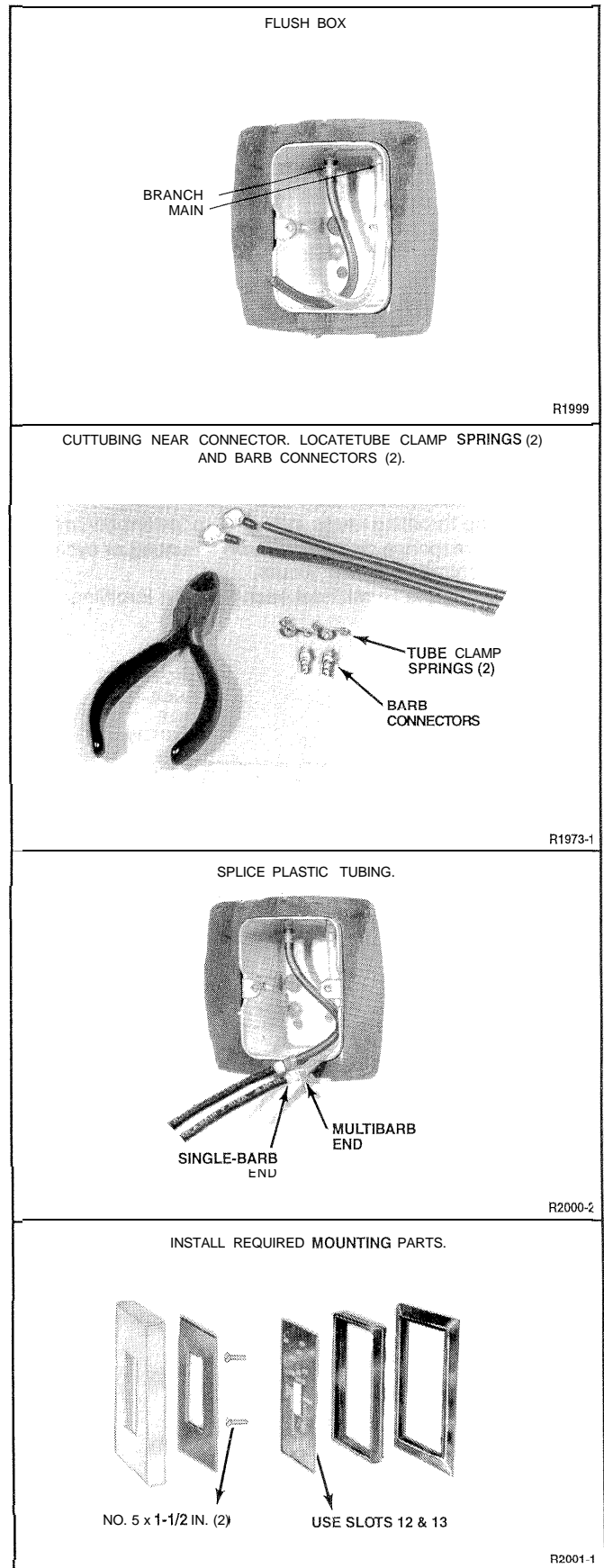


Fig. 17. Robertshaw T10, T20, T30, T50, and H10 replacement—flush box mounting.

## Humidistat Calibration

### Equipment Require

Digital Relative Humidity indicator Pen CCT915 or other accurate rh measuring device  
 Pressure Gage 14003519-001 (0 TO 30 psi [0 to 207 kPa])  
 Gage Adapter MQP729 (CCT729)  
 Thermostat Tool MQT735A (CCT735A)

### Throttling Range Adjustment

The throttling range is factory set and should not require any change under normal operating conditions" If a change in relative humidity causes the system to hunt, reset the throttling range as follows:

- ❶ Slide the throttling range indicator (Fig. 18) to the desired indication on the scale.
- ❷ Move the throttling range indicator up toward minimum on slow response or move it down if hunting or cycling of the controlled device occurs.
- ❸ Recalibrate the Humidistat each time the throttling range is changed.

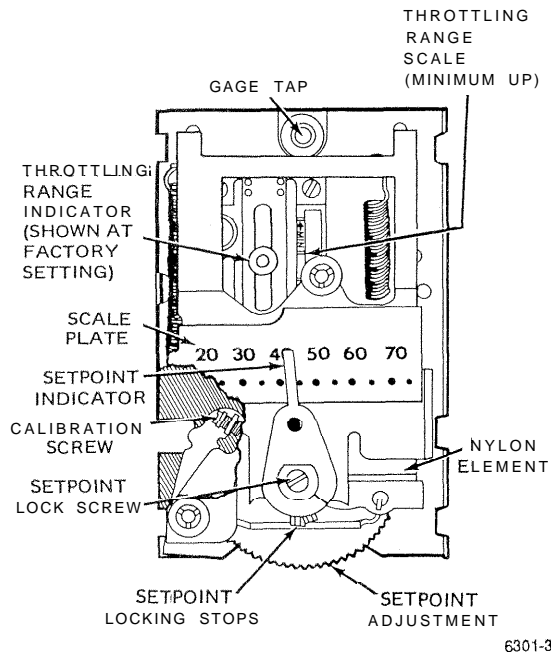


Fig. 18. Humidistat with the cover off showing the adjustment points.

### Calibration Check

- ❶ Measure the rh with a Digital Relative Humidity Indicator Pen CCT915 or other accurate rh measuring device,
- ❷ Turn the setpoint adjustment until the setpoint indicator reads 10 percent below (HP970A) or above (HP9706 and HP972B) the indicated rh and allow the Humidistat to build up BLP.
- ❸ Turn the setpoint indicator up (HP970A) or down (HP970B and HP972B) slowly using the setpoint adjustment.
- ❹ If the Humidistat bleeds off at  $\pm 3$  percent rh of the indicated humidity, no further calibration is necessary, If the Humidistat does not bleed off properly, proceed with RECALIBRATION.

### Recalibration

## ⚠ CAUTION

Humidistats are sensitive. Handle them with extreme care during calibration. Do not breathe directly on the element when the cover is off.

- ❶ Ensure the system is stabilized and the main line is maintained at normal pressure between 13 and 21 psi (90 and 145 kPa). Factory calibration is 18 psi (125 kPa).
- ❷ Install the Pressure Gage into the gage tap (Fig. 4) using the Gage Adapter.
- ❸ Measure the rh with a Digital Relative Humidity Indicator Pen CCT915 or other accurate rh measuring device.
- ❹ Use the setpoint adjustment to set the setpoint indicator at the actual relative humidity.
- ❺ Adjust the calibration screw (Fig. 18) until the Pressure Gage reads 0 psi (0 kPa).
- ❻ Readjust the calibration screw slowly until the Pressure Gage reads  $8 \pm 1$  psi ( $55 \pm 7$  kPa).
- ❼ Allow sufficient time for a complete response and stabilization, then recheck pressure. The Humidistat is now calibrated.
- ❽ Remove the Pressure Gage and Gage Adapter.  
 NOTE: If the gage tap fails to seal properly after the Pressure Gage is removed, bleed off a small amount of air and insert Gage Tap Plug 14002172-001 into the gage tap.
- ❾ Set the Humidistat at the desired setting.
- ❿ Proceed to HUMIDISTAT/THERMOSTAT COVER MOUNTING.

## Thermostat Calibration

### NOTES:

1. The Thermostats are accurately factory calibrated and should require only the CALIBRATION CHECK to ensure correct operation"
2. The antihum spring (Fig. 19) must be free. Be sure the spring just touches the throttling plate and is not wedged against it (does not apply to all TP970C and D or any TP970 series starting with 2000, i.e., TP972A2-i 43).
3. The Thermostats are very sensitive and should not be heated by excessive handling during calibration.
4. Calibration of the TP974 is not recommended.
5. To check calibration or to recalibrate the TP978 ZEB Thermostats, measure actual room temperature with a test thermometer. The 75F (246) limit is nonadjustable.

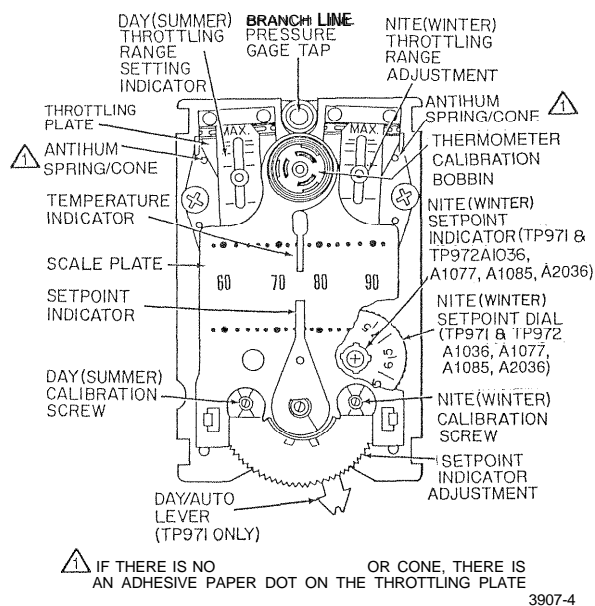


Fig. 19. Thermostat front view with cover off showing controls and indicators.

### Equipment Required

Accurate thermometer  
 Pressure Gage 1400351 9-001 (0 to 30 psi [0 to 207 kPa])  
 Gage Adapter MQP729 (CCT729)  
 Thermostat Tool MQT735A (CCT735A) or 0.05 in. (3/64 in.) hex key  
 Thermometer Calibration Tool MQT970 (for all models or an 1/8-in. hex wrench for series thermostats starting with 2000 [e.g., TP972A21 43])

### Calibration Check

- 1 Set the Thermostat to the desired setpoint and allow the system to stabilize before proceeding.

- 2 Turn the setpoint indicator adjustment down (DA) or up (RA) until the setpoint indicator reads 5 degrees F (2.8 degrees C) below (DA) or above (RA) room temperature. If the BLP at the Thermostat does not build up within 30 seconds, proceed to CALIBRATION PROCEDURE.
- 3 Turn the setpoint indicator adjustment up (DA) or down (RA) slowly. If the Thermostat does not bleed off audibly between 1 and 3 degrees F (0.56 and 1.7 degrees C) below (DA) or above (RA) room temperature, proceed to CALIBRATION PROCEDURE.

### Calibration Procedure

- 1 Measure the ambient temperature with an accurate thermometer. Compare the thermometer reading with the Thermostat thermometer reading.
- 2 If the difference is more than 1 degree F (0.56 degree C), use the Thermometer Calibration Tool or hex wrench to turn the Thermostat thermometer calibration bobbin (Fig. 19) until the Thermostat thermometer reading is correct.
- 3 Ensure the main line pressure is at the recommended setting.
- 4 All Thermostats except the TP978E: Install the Pressure Gage with the Gage Adapter into the branchline pressure gage tap.  
 TP978E: Install the Pressure Gage in the branch line remote from the TP978E.
- 5 Turn the setpoint indicator adjustment until the setpoint indicator reads the existing temperature.
- 6 Follow the remaining steps shown for the Thermostat being calibrated.

### TP970A and B

- 1 Set the throttling range to the value specified on the job drawing.
- 2 Turn the calibration screw (Fig. 19) until the Pressure Gage reads 0 psi (0 kPa).
- 3 Turn the calibration screw in the opposite direction until the Pressure Gage reads  $8 \pm 1$  psi ( $55 \pm 7$  kPa).
- 4 The TP970 is now calibrated. The setpoint indicator and thermometer should be within 1 degree F (0.56 degree C) of each other.
- 5 Remove the Pressure Gage and Gage Adapter.
- 6 Turn the setpoint indicator adjustment until the setpoint indicator is at the desired setting.
- 7 Proceed to SWITCHOVER CALIBRATION PROCEDURE.

### TP970C and D

- 1 Set the throttling range to the value specified on the job drawing.

- ② Check the mechanical throttling range by turning the setpoint indicator adjustment to determine the difference in setpoint indicator readings when BLP reads 3 psi (21 kPa) and 13 psi (90 kPa). It may be necessary to turn the calibration screw to obtain his measurement.
- ③ Reset the throttling range to within  $\pm 2$  degrees F ( $\pm 1.1$  degrees C) of the specified throttling range for accurate control. If either the throttling range adjustment or calibration screw were changed, recalibrate the Thermostat.
- ④ See TP970A AND B, beginning at Step 1, for the balance of TP970C and 5 calibration.

### TP971A,B, D, and E and TP972A

- ① With 13 psi (90 kPa) main line pressure, turn the DAY (SUMMER) (left) calibration screw (Fig. 19) until the Pressure Gage reads 0 psi (0 kPa).
- ② Turn the calibration screw in the opposite direction until the Pressure Gage reads  $8 \pm 1$  psi ( $55 \pm 7$  kPa).
- ③ TP971A, B, D, AND E ONLY: With 18 psi (124 kPa) main line pressure, rotate the NITE (WINTER) setpoint dial until the setting agrees with the indicated temperature.
- ④ With 18 psi (124 kPa) main line pressure, repeat Steps 1 and 2 using the NITE (WINTER) (right) calibration screw (Fig. 19).
- ⑤ Remove the Pressure Gage and Gage Adapter.
- ⑥ Proceed to SWITCHOVER CALIBRATION PROCEDURE.

### TP973A and B

If the Thermostat is not properly calibrated, but the remainder of the system is operating properly, turn the calibration screw until the thermostat performs as in Step 2 under CALIBRATION CHECK.

### TP974A

Do not calibrate the TP974A.

### TP978A-E

See the TP973A and B calibration procedure.

### Switchover Calibration Procedure (TP971A, B, D, E and TP972A only)

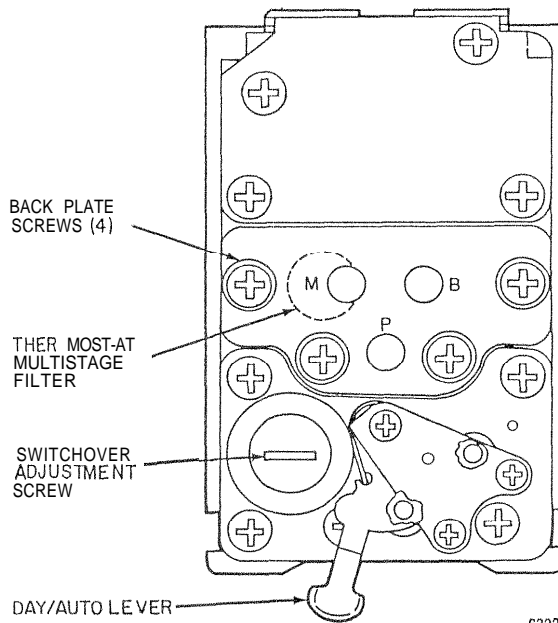
Switchover allows for proper Humidist/Thermostat operation in the presence of normal supply line fluctuations.

- ① Ensure that the main line pressure is set to the low (13 psi [90 kPa]) pressure requirement.
- ② Turn the setpoint indicator adjustment until the setpoint indicator reads 5 degrees F (2.8 degrees C) below actual temperature.
- ③ The Pressure Gage should read:

TP971A, B, D, AND, E:  
0 psi (0 kPa) (RA) or 13 psi (90 kPa) (DA).  
TP972A:  
0 psi (0 kPa).

If it does not, turn the switchover adjustment screw (Fig. 20) clockwise until it does.

- ④ Turn the switchover adjustment screw counterclockwise until the pressure begins to:
  - TP971A, B, D, AND, E:  
Increase (RA) or decrease (DA).
  - TP972A:  
Increase.
 This indicates switchover.
- ⑤ Allow the Pressure Gage to go to:
  - TP971A, B, 5, AND, E:  
Full main line pressure (RA) or 0 psi (0 kPa) (DA).
  - TP972A:  
Full main line pressure.
- ⑥ Turn the switchover adjustment screw counterclockwise until the pressure:
  - TP971A, B, D, AND, E:  
Decreases to 0 psi (0 kPa) (RA) or increases to full main line pressure (DA).
  - TP972A:  
Decreases to 0 psi (0 kPa).
- ⑦ Turn the switchover adjustment screw an additional 1/8- to 1/4-turn clockwise.



6332-2

Fig. 20. Back view of thermostat showing switchover adjustment screw and DAY/AUTO lever.

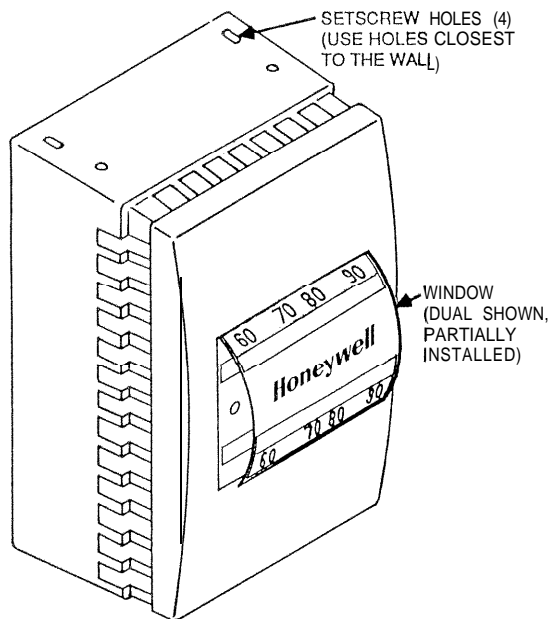
## Humidistat/Thermostat Cover Mounting

- ❶ Remove the caution card from the cover.
- ❷ Select the correct window (vertical or horizontal/dual or blank) and peel the release liner from window back.

### ⚠ CAUTION

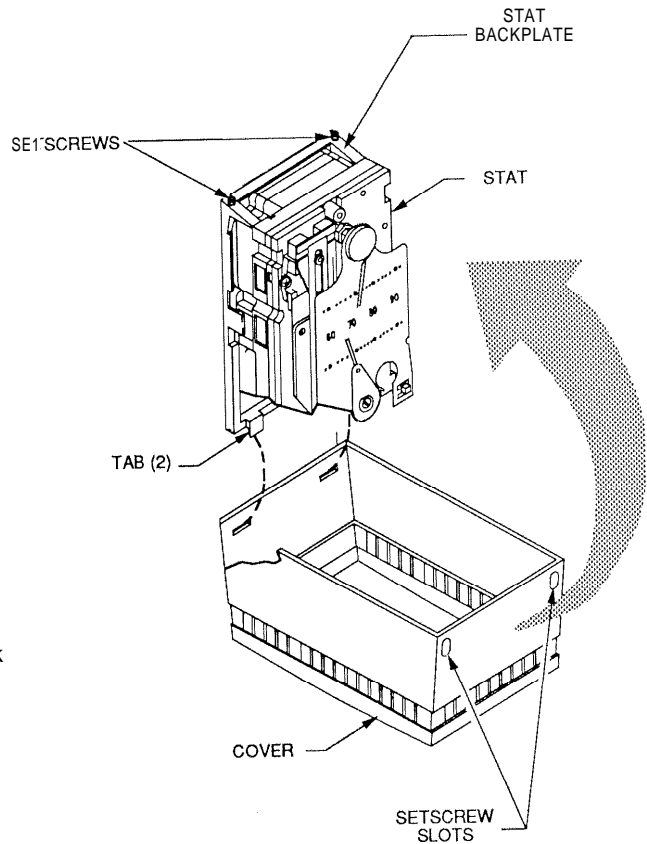
Before installing the window, carefully check the window selection and orientation. Once assembled, disassembly may damage the window.

- ❸ Ensure that the window is oriented correctly for the installation. When viewed from the front of the cover, the setpoint and day/auto openings are on the bottom for a vertical Thermostat or on the right for a horizontal Thermostat. The cover has slots which must mate with the mounting tabs on the backplate.
  - a. Insert the top edge of the window into the slot in the top of the window hole (Fig. 21).
  - b. Bend the window slightly and pop the bottom edge into the slot in the bottom of the window hole.
  - c. Press in place to secure window.
- ❹ Mount the cover by hooking the two slots on the cover bottom (right end for horizontal mounting) to the tabs on the backplate (Fig. 22). Swing the cover into place. Back out (counterclockwise) the setscrews with the Thermostat Tool to secure the cover.



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Fig. 21. Assembly of cover with window and insert.



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Fig. 22. Mounting cover.

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