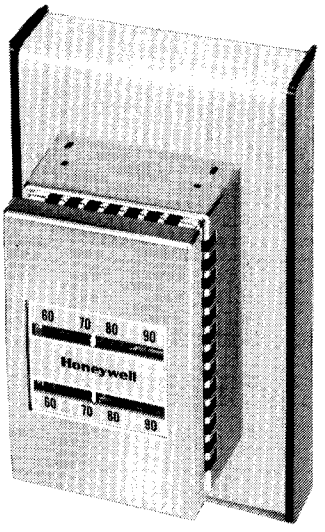
Honeywell

Replacement Data

TP970 SERIES THERMOSTAT MODERNIZATION KIT INCLUDING 14003192 WALL PLATE ADAPTER KIT



R3369

GENERAL

This Modernization Kit allows replacing TO900/TP900 Series, TO910/TP910 Series, and TP923 thermostats with TP970 Series thermostats (see Table 1). The replacement thermostat mounts vertically or horizontally. It adapts to mortar joint fittings, surface or flush banjo fittings, or horizontal flush box connections. A heavy duty guard can be used with the kit.

The appropriate kit can replace one- or two-pipe thermostats. Table 2 shows which parts are applicable for the thermostat being replaced.

Table 1. TP970 Series Modernization Kit Parts.

O.S. No.	Includes: (1)
TP970A2053	TP970A2004
TP970B2036	TP970B2002
TP971A2045	TP971A2003
TP972A2044	TP972A2002
TP973A2092	TP973A2076

(1) All kits include the 14003192 Wall Plate Adapter Kit and a satin chrome cover.

T919

BEFORE INSTALLATION

Do not remove the antikink springs from cut tubing. If Heavy Duty Guard 14002430-001 is required, it must be ordered separately.

95-7255
Commercial Bldg Group
MLF TAB: II. C. 10.

Rev. 11-88

Table 2. Modernization Kit Parts.

14003192 Wall Plate Adapter Kit Includes Parts Required for Replacing: (1)				
Part	**Qty**	**TO900/ TP900 Series**	**TO910/ TP910 Series**	**TP923 Thermostat**
Air Connector Assembly	3	X	X	X
Wall Plate Adapter:				
Base Plate	1	X	X	X
Base Plate Cover	1	X	X	X
Adapter	1	X	—	—
Tubing Plug	1	—	—	X
Filtered Restriction	1	—	—	X
1/4 x 1/4 in. Compression to Barb Fitting	3	—	—	X
1/4 in. O.D. Plastic Tubing	3	—	—	X
1/4 x 5/32 in. Barb Coupling	1	—	—	X
5/32 in. O.D. Plastic Tubing (2)	1	—	—	X
Washer-Seal	3	2	—	—
Spacer	2	2	—	—
Washer	2	X	—	—
O-Ring (3)	3	—	X	X
Tinnerman Clips (4)	2	X	X	X
Screws, Roundhead (4)				
6-32 x 1/2 in. (5)	2	X	—	—
6-32 x 3/4 in.	2	X	X	X
6-32 x 7/8 in.	2	—	X	X
6-32 x 1-1/16 in. (5)	2	—	X	X
6-32 x 1-1/4 in.	2	X	X	X
6-32 x 1-3/4 in.	2	X	X	X

(1) X=use as required.

(2) Use tubing from extra air connector assembly.

(3) Use new O-rings only when necessary to prevent leaking.

(4) See specific instructions for type and number of screws and clips.

(5) Supplied with thermostat.

6. Discard unused parts.

T861

INSTALLATION

TO900 OR TP900 WITH HORIZONTAL FLUSH MOUNTED BOX

1. Attach the air tube connectors to the adapter (Fig. 1).
2. Place the washer-seals on the open ends of the connectors.
3. Mount the adapter and tubing assembly to the box (Fig. 1). Make sure the air tube connectors are aligned with their respective outlets.
4. Thread the tubes through the opening in the baseplate and mount the baseplate (Fig. 2). Level baseplate before tightening the screws.
5. Slip the Tinnerman clips onto the baseplate with the threads below the baseplate (Fig. 3).
6. Set the baseplate cover on the baseplate and thread the tubing through hole in the cover.
7. If heavy duty guard (Fig. 8) is required, thread tubing through guard base.
8. Cut tubing (Fig. 9).
9. Connect the tubing to the thermostat backplate (Fig. 4) and use the screws to mount the backplate to the baseplate (Fig. 3). This holds the baseplate cover (and guard base) in place.
10. Remove shipping stops (Fig. 5) and press the thermostat onto the backplate (Fig. 6) until fully seated and the retaining clips on the backplate (Fig. 4) have engaged.

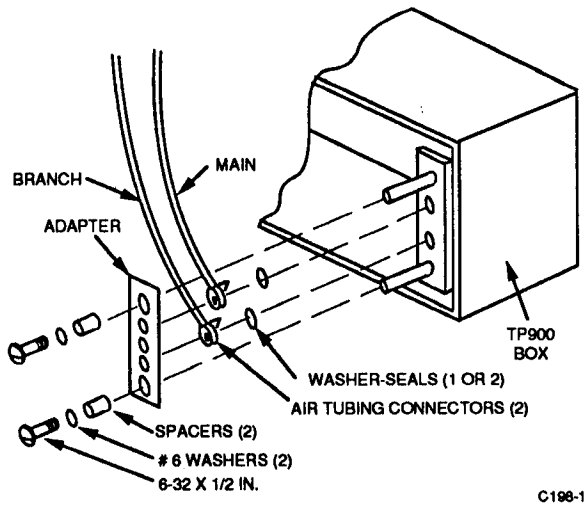


Fig. 1. Adapter Connections, TO900/TP900 Replacement.

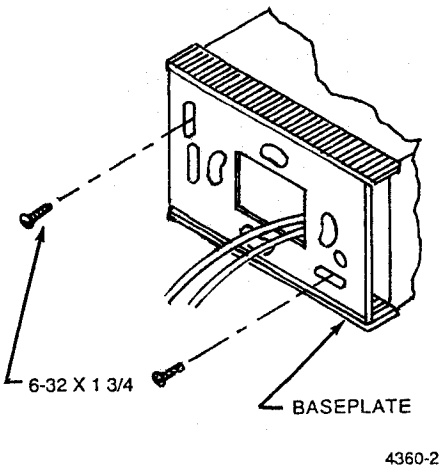


Fig. 2. Baseplate Mounting, TO900/TP900 Replacement.

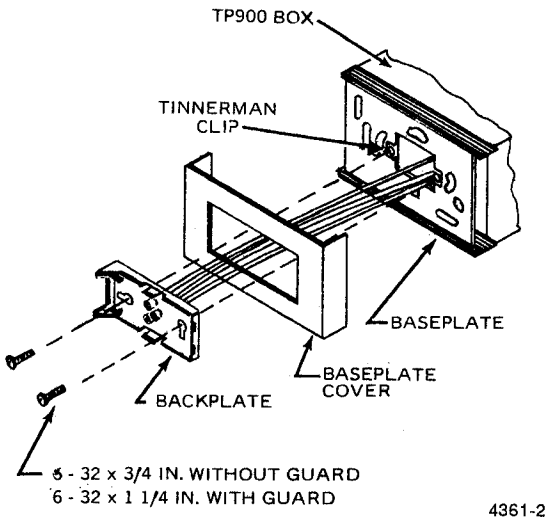


Fig. 3. Backplate to Baseplate Assembly, TO900/TP900 Replacement.

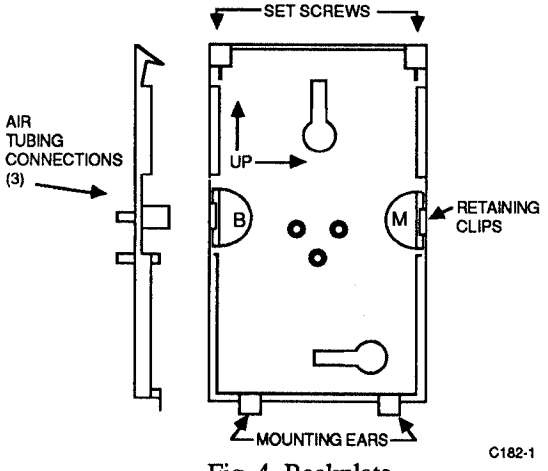


Fig. 4. Backplate.

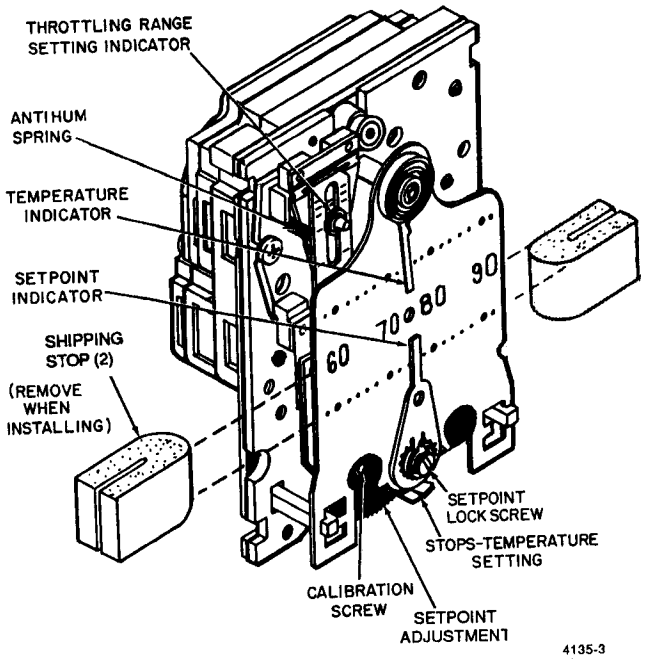


Fig. 5. TP970 Series Thermostat with Cover Removed.

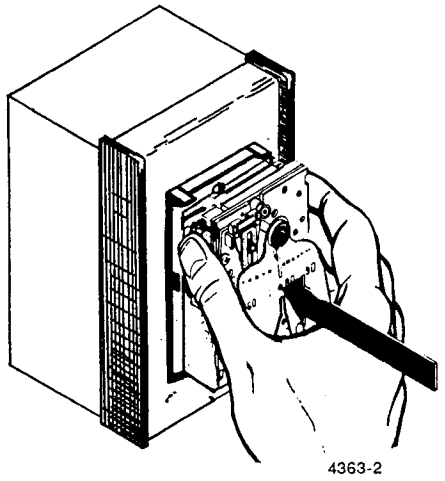


Fig. 6. Thermostat Mounting to Backplate.

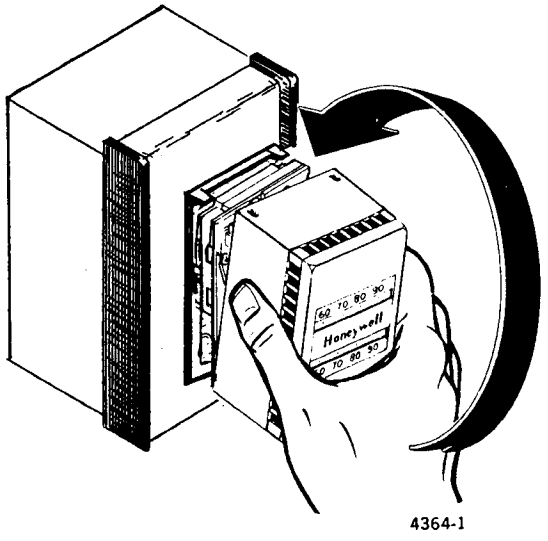


Fig. 7. Thermostat Cover Mounting.

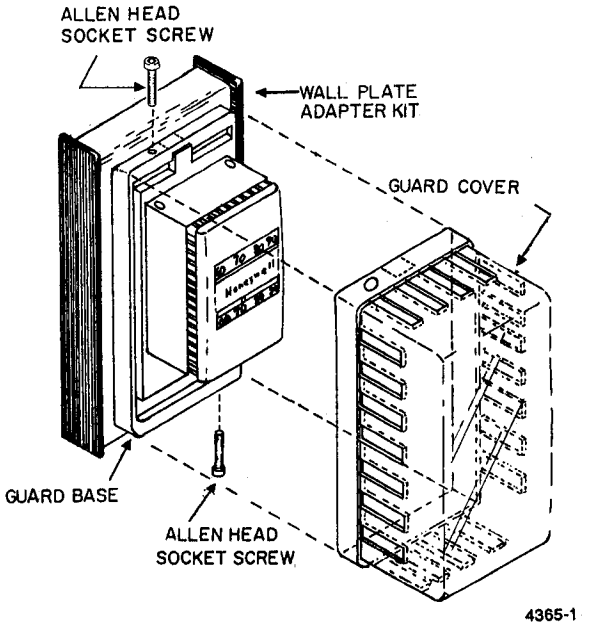
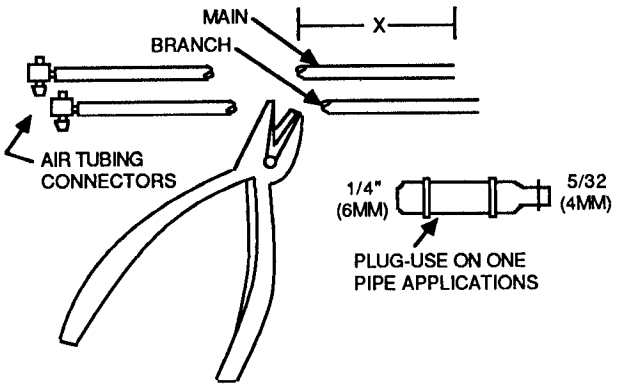


Fig. 8. Heavy Duty Guard Mounting.

TP910 SERIES WITH MORTAR JOINT FITTING

1. Trim tubing to suit application (Fig. 9) and discard air tube connector ends.
2. Insert tubes into the O-rings of the main and branch lines of the mortar joint fittings.
   NOTE: Use new O-rings supplied only if necessary to prevent air leaks.
3. Thread tubing through the opening in the baseplate and mount (Fig. 10). Level baseplate before tightening screws.
4. Slip two Tinnerman clips onto the baseplate with the threads below the baseplate (Fig. 11).
5. Set the baseplate cover on the baseplate and feed the tubing through the opening (vertical mounting: Fig. 11; horizontal mounting: Fig. 12).
6. If heavy duty guard (Fig. 8) is required, thread tubing through guard base.
7. Connect the tubing to the thermostat backplate (Fig. 4) and use the screws to mount the backplate to the baseplate (vertical mounting: Fig. 11; horizontal mounting: Fig. 12). This holds the baseplate cover (and guard base) in place.
   NOTE: Vertical mounting only: Tubes will cross as main and branch are reversed on TP970 thermostats.
8. Remove shipping stops (Fig. 5) and press the thermostat onto the backplate (Fig. 6) until fully seated and the retaining clips on the backplate (Fig. 4) have engaged.



THERMOSTAT APPLICATION	X DIMENSION IN IN. (MM)	
	MORTAR JOINT FITTING	BANJO FITTING
W/O GUARD	2-1/4 (57)	2-1/2 (64)
W/GUARD	2-3/4 (70)	3 (76)

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Fig. 9. Tubing Length.

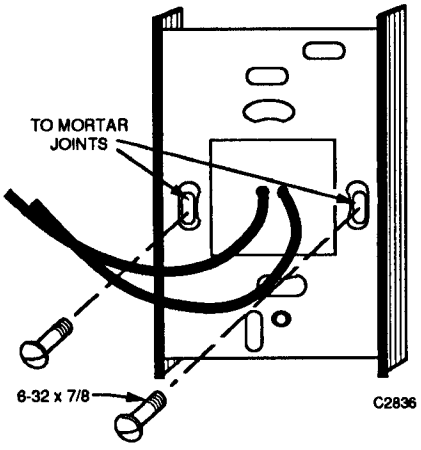

Fig. 10. Baseplate with Tubing through Opening.

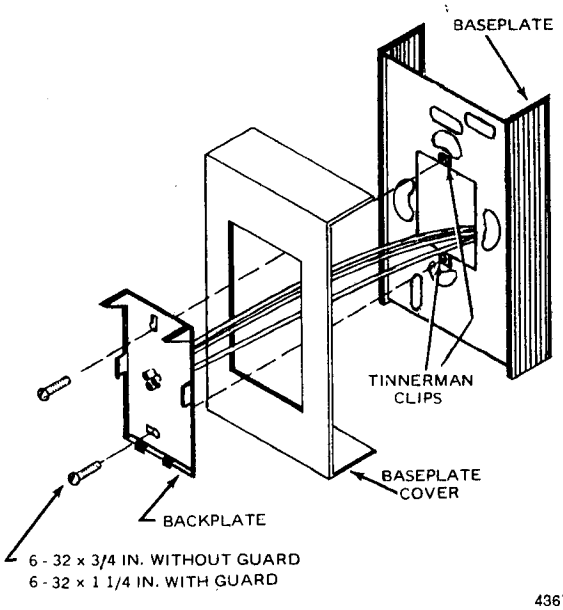

Fig. 11. Vertical Mounting, TP910 Replacement.

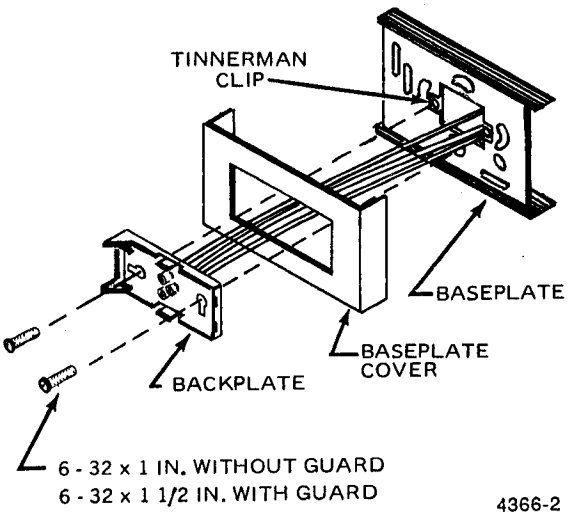

Fig. 12. Horizontal Mounting, TP910 Replacement.

TP910 SERIES WITH FLUSH BANJO FITTING

Follow the procedures for vertical mounting on a mortar joint fitting. Note tubing length in Figure 9. For horizontal mounting, rotate ring 90 degrees (Fig. 13).

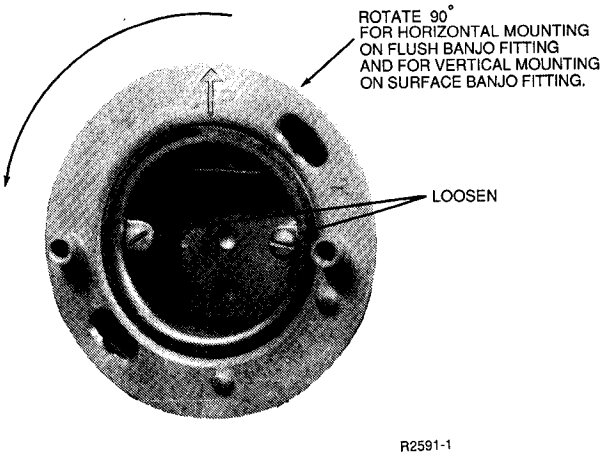

Fig. 13. Banjo Fitting Ring Rotation.

TP910 SERIES WITH SURFACE BANJO FITTING

1. For vertical mounting rotate ring 90 degrees (Fig. 13).
2. Cut tubing (Fig. 9) and insert into the proper outlets in the banjo fitting.
3. If tubing to banjo fitting is run exposed on wall surface, remove break-out section of baseplate or baseplate cover (Fig. 14).
4. Thread tubing through baseplate (Fig. 15) (and heavy duty guard base, if required) and connect the tubes to the backplate.
5. Mount the baseplate so the threaded bosses on the ring are aligned with the slot and the hole on the baseplate.
6. Use two 6-32 x 1/2 in. screws to attach baseplate, baseplate cover, and backplate to banjo or 6-32 x 1-1/4 in. screws if heavy duty guard is required.
7. Remove shipping stops (Fig. 5) and press the thermostat onto the backplate (Fig. 6) until it is fully seated and the retaining clips on the backplate (Fig. 4) have engaged.

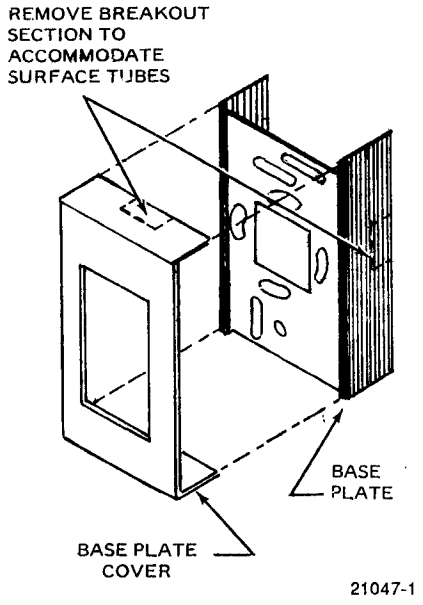

Fig. 14. Breakout Sections for Surface Mounted Tubes.

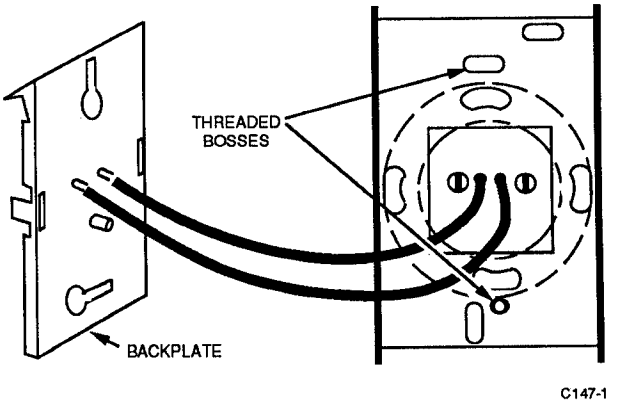

Fig. 15. Threaded Bosses Shown through Slots in Baseplate.

TP923 REPLACEMENT

Locate existing restrictor:

1. Remote Location:
   a. Replace it with the one supplied in the kit.
      1) Figures 16 and 17 show typical installations of restrictors.
      2) Figure 18 shows a typical replacement installation.
      3) Figure 19 shows the connection to the backplate with the main port capped.
   b. Follow the instructions for a TP910 thermostat to complete the installation.
2. Located behind the thermostat and connected to a two-pipe fitting:
   a. Remove the restriction.
   b. Follow instructions for replacing a TP910 thermostat.

   NOTES:
   1. The TP973 has a built-in restriction and can be piped with either one or two pipes.
   2. If a restrictor with a shape other than shown in Figures 16 or 17 is encountered, determine piping and pipe the replacement (Fig. 18).

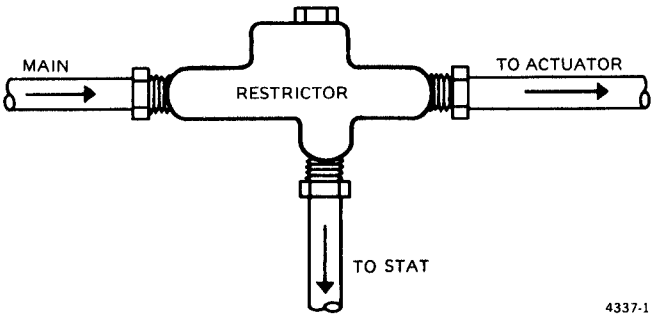

Fig. 16. Typical Existing Adjustable Restrictor with 1/4-Inch O.D. Copper Tubing.

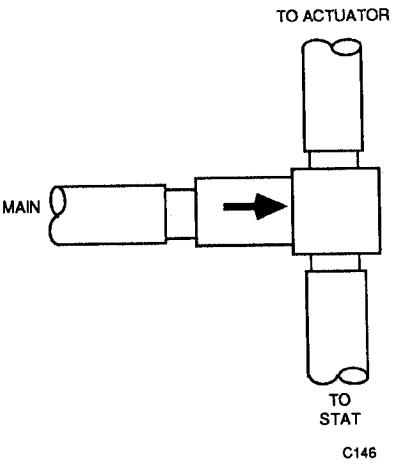

Fig. 17. Typical Tee Restrictor with Plastic Tubing.

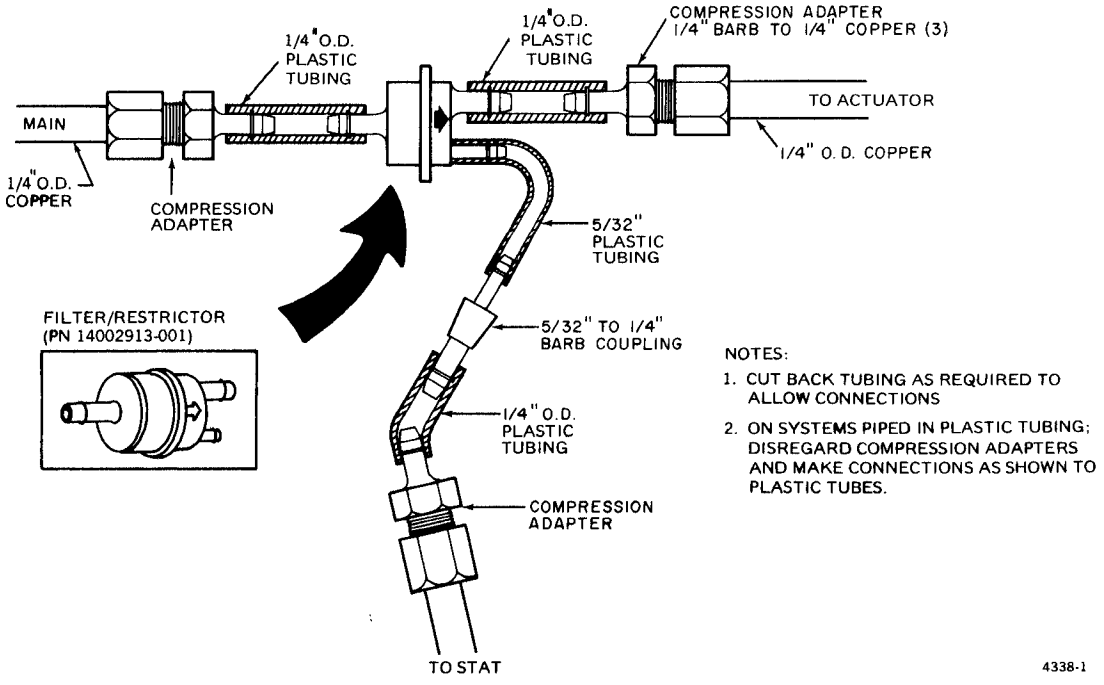

Fig. 18. Replacement Restrictor Installation.

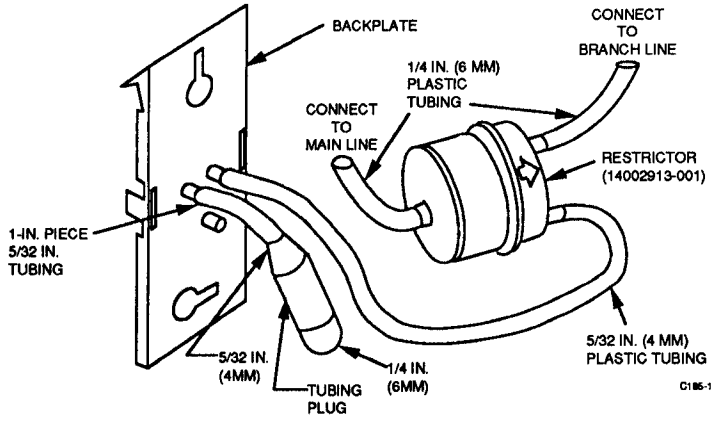

Fig. 19. Backplate Connections for One-Pipe Installation.

THERMOSTAT COVER MOUNTING

1. Remove caution card from cover.
2. Select the correct window (vertical or horizontal/dual or blank) and peal release liner from window back.
3. Bend the window slightly, pop it into the hole and press in place as shown (Fig. 20). Be careful 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 bars on the backplate (Fig. 4).

CAUTION

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

4. Mount the cover. Hook the two slots on the cover bottom (right end for horizontal mounting) to the ears on the backplate. Swing the cover into place and back out (counterclockwise) the setscrews with a thermostat tool or a 0.050-inch Allen wrench to secure.

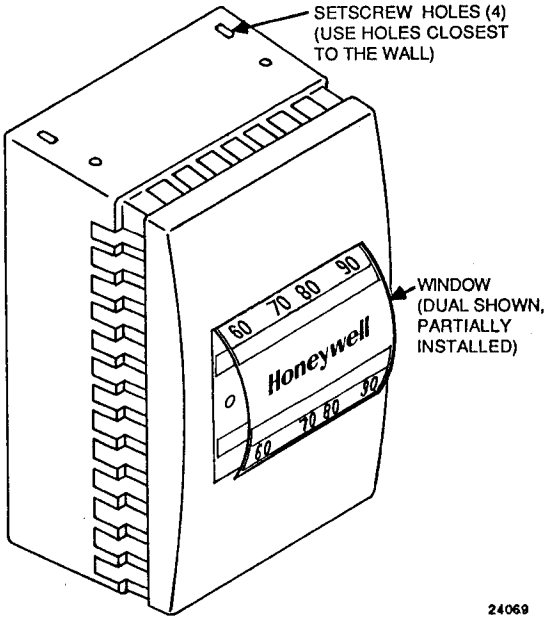

Fig. 20. Assembly of Cover with Window and Insert.

ADJUSTMENTS

After installation, set the thermostat to the desired setpoint and let the system operate long enough to stabilize. Make certain that the system is stable before checking calibration.

NOTE: All thermostats are accurately factory calibrated and should require only the CALIBRATION CHECK to ensure correct operation.

EQUIPMENT REQUIRED

The following equipment is available from the Memphis Service Center:

Gage 305965, 0 to 30 psi
Tool Kit MQT3863 (includes gage adapter, TP900 Series Thermostat Key, and TP970 Series Thermostat Tool)

THROTTLING RANGE

The throttling range (TR) is factory set at 4F (2C) and should not require any change under normal operating conditions.

If a throttling range change is necessary, use the following procedures to reset the throttling range to the values specified on the job drawings.

1. Remove cover and install 0 to 30 psi (0 to 210 kPa) gage in gage tap (Fig. 21).
2. Slide the throttling range adjustment to the desired position on the throttling range scale.
3. Mechanically check the TR by moving setpoint adjustment until branchline pressure (BLP) is 3 psi (21 kPa) and note the setpoint. Move the setpoint adjustment until the BLP is 13 psi (90 kPa) and note the setpoint. The difference in setpoints is the throttling range.
   NOTE: The ambient temperature ±1/2 of the throttling range must not exceed the minimum or maximum setpoints of the thermostat. This procedure will not work for a TP970A1038 which has a minimum setpoint of 60F (15C) if the throttling range is 6F (3.3C) and the ambient temperature is 62F (16C).
4. Recalibrate using RECALIBRATION procedures.

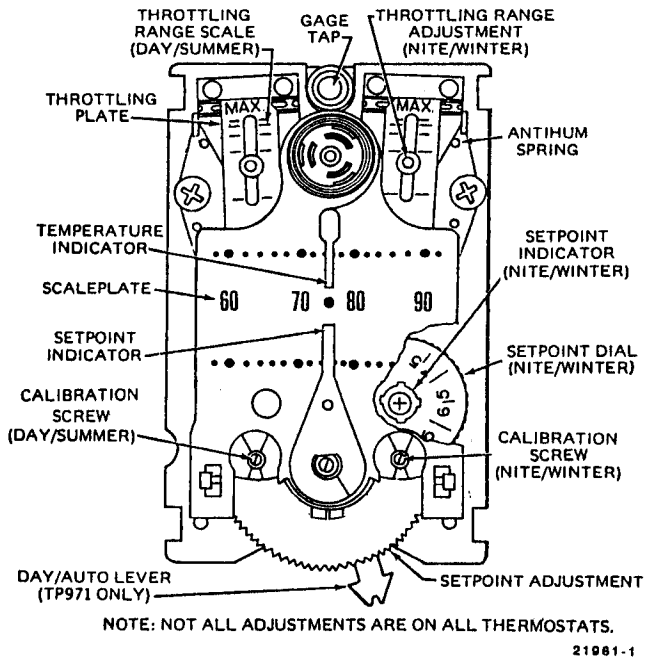

Fig. 21. TP971 and TP972 Controls and Indicators, Front View with Cover Removed.

SETPOINT LOCK

To set minimum or maximum setpoint limits:

1. Loosen the setpoint lockscrew (Fig. 5).
2. Move the stops to the desired position.
3. Tighten the setpoint lockscrew.
4. Check the positioning of the stops by changing the setpoint.

CHANGEOVER

TP971 and TP972 thermostats have changeover features. The TP971 has day/night changeover and the TP972 has summer/winter changeover. TP971 controls direct acting at day setting with 13 psi (90 kPa) main air pressure and direct acting at the night setting with 18 psi (124 kPa) main air pressure. The TP972 controls reverse acting (RA) for summer cooling at 13 psi (90 kPa) main air pressure and direct acting (DA) for winter heating at 18 psi (124 kPa) main air pressure.

The BLP drops as the temperature drops when the thermostat is operating DA. The BLP drops as the temperature rises when the thermostat is operating RA.

CHANGEOVER CONVERSION

On some systems the lower main air pressure is 14 or 15 psi (97 or 103 kPa). On these systems turn the changeover adjustment screw (Fig. 22) one-half turn clockwise for each 1 psi (7 kPa) over 13 psi (90 kPa).

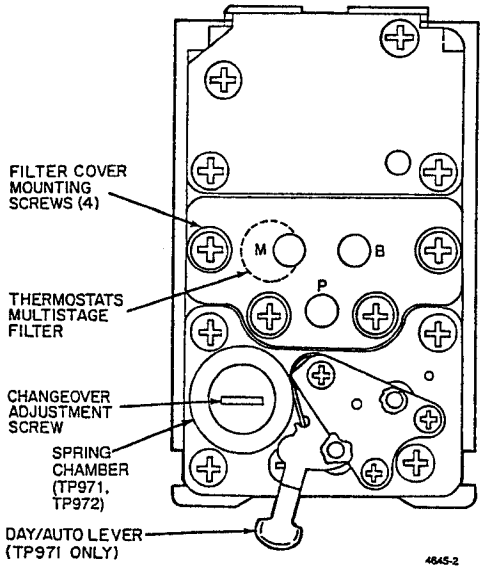

Fig. 22. TP970 Series Thermostat—Back View without Backplate.

TP971s or TP972s used on systems having 16/21 psi (110/145 kPa) or 13/16/21 psi (90/110/145 kPa) main air pressure require a different spring for proper changeover operation. Change the spring as follows:

1. Remove the changeover adjustment screw (Fig. 22).
2. Replace the gold-colored spring with the silver-colored spring furnished in the PT971 kit. Order 14002373-001 Spring for PT972 conversion.

3. Reinstall the changeover adjustment screw and set flush with the top of the spring chamber.
4. Follow CHANGEOVER CALIBRATION CHECK procedures and recalibrate if necessary.

CHANGEOVER CALIBRATION CHECK

1. Set main air pressure to the higher pressure setting (night or winter).
2. Insert gage using gage adapter into gage tap (Fig. 21) to read BLP. If the results in Steps 3 or 5 are not correct, go to CHANGEOVER CALIBRATION.
3. TP971:
   Turn day setpoint adjustment until setpoint indicator reads approximately 10F (5.6C) degrees above space temperature and set the night setpoint dial 10F (5.6C) below space temperature. The gage should indicate main air pressure. Push the day/auto lever to the day (left-hand) position; it should stay there and the BLP should go to 0 psi (0 kPa).
   TP972:
   Turn the setpoint adjustment until setpoint indicator reads approximately 10F (5.6C) degrees above space temperature. BLP on all except TP972A1143 should go to 0 psi (0 kPa). The TP972A1143 should go to main air pressure.
4. Set main air pressure to lower pressure setting (day or summer). Use 16 psi (110 kPa) on 13/16/21 psi (90/110/145 kPa) systems.
5. TP971:
   Set day setpoint adjustment and night setpoint dial as in Step 3. BLP should go to zero. Push the day/auto lever to the day (left) position, it should return to the auto position when released.
   TP972:
   Set setpoint adjustment as in Step 3. BLP on all except TP972A1143 should go to main air pressure. TP972A1143 should go to 0 psi.

CHANGEOVER CALIBRATION

1. Remove thermostat from the wall.
2. Loosen screws holding backplate in position. Do not disconnect piping from backplate.
3. Plug thermostat into backplate.
4. Use one of the following changeover procedures for calibration.

WITH BRANCHLINE PRESSURE GAGE

If the thermostat changeover was not correct at Step 3 of the CHANGEOVER CALIBRATION CHECK, use the screwdriver end of the thermostat tool to turn the changeover adjustment screw (Fig. 23) one-quarter turn counterclockwise. Make a CHANGEOVER CALIBRATION CHECK. Continue with one-quarter turn adjustments followed by a CHANGEOVER CALIBRATION CHECK until the changeover point is correct.

If the thermostat changeover was not correct at Step 5 of the CHANGEOVER CALIBRATION CHECK, use the TP970 Series thermostat tool to turn the changeover adjustment screw one-quarter turn clockwise (Fig. 23). Make a CHANGEOVER CALIBRATION CHECK. Continue with one-quarter turn adjustments followed by a CHANGEOVER CALIBRATION CHECK until the changeover point is correct.

WITHOUT BRANCHLINE GAGE (TP971 Only)

1. Set system pressure to 18 psi (124 kPa) (night pressure).
2. Hold the day/auto lever in the day (left) position. Turn the changeover adjustment screw counterclockwise until the lever holds in place.
3. Release the lever and slowly turn the changeover adjustment screw clockwise until the lever snaps back to the auto position.
4. Turn the changeover adjustment screw an additional one-eighth to one-quarter turn clockwise. This places the changeover in calibration and allows for normal main air pressure fluctuations.

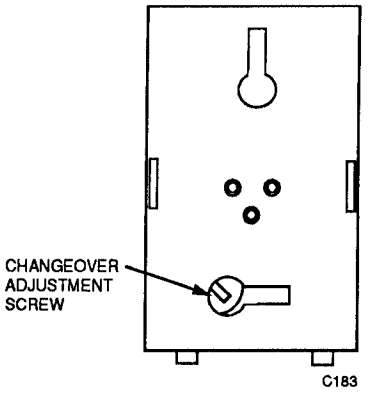

Fig. 23. Location of Calibration Adjustment Screw with Backplate Attached.

CALIBRATION CHECK (TP970A, B, TP971A, TP972A, and TP973)

Direct-acting, bimetal elements:

1. Turn setpoint adjustment until setpoint indicator reads 5F (2.8C) below actual space temperature and allow thermostat to build up BLP.
2. Turn setpoint indicator adjustment (Fig. 21) up slowly.
3. If thermostat begins to bleed off between 1 and 3F (0.5 and 1.5C) below space temperature, no calibration is necessary.

Reverse-acting, bimetal elements:

1. Turn setpoint adjustment until setpoint indicator reads 5F (2.8C) above actual space temperature as measured by a test thermometer, and allow thermostat to build up BLP.
2. Turn setpoint indicator adjustment (Fig. 21) down slowly.
3. If thermostat begins to bleed off between 1 and 3F (0.5 and 1.5C) above space temperature, no calibration is necessary.

RECALIBRATION

NOTE: Before proceeding with recalibration, be sure the antihum spring(s) (Fig. 21) just touches the throttling plate and is not wedged against it.

CAUTION

The thermostat is very sensitive and should not be heated by excessive handling during calibration.

NOTE: The 30-psi gage referred to in the following procedures is the gage with gage adapter listed in the EQUIPMENT REQUIRED section.

TP970, TP973

1. Remove the cover and install a 30-psi gage into the gage tap.
2. Turn the setpoint adjustment until the setpoint indicator reads the space temperature.
3. Turn the calibration screw (Fig. 5) until the gage indicates 0 psi.
4. Turn the calibration screw in the opposite direction until the gage indicates 8 ±1 psi (56 ±7 kPa). The thermostat is now calibrated.
5. Remove the gage and replace the cover.

TP971

1. Remove the cover and install a 30-psi gage into the gage tap.
2. Turn the setpoint adjustment until the setpoint indicator reads the indicated temperature.
3. With 13 psi (90 kPa) day main air pressure, turn the day (left) calibration screw (Fig. 21) until the gage indicates 0 psi.
4. Turn the calibration screw in the opposite direction until the gage indicates 8 ±1 psi (56 ±7 kPa).
5. With 18 psi (126 kPa) night main air pressure, rotate the night setpoint dial until its setting agrees with the indicated temperature.
6. Repeat Steps 3 and 4 using the night (right) calibration screw. The thermostat is now in calibration.
7. Remove the gage and replace cover.

TP972

1. Remove the cover and install a 30-psi gage into the gage tap.
2. Turn the setpoint adjustment until the setpoint indicator reads the indicated temperature.
3. With 13 psi (90 kPa) summer main air pressure, turn the summer (left) calibration screw (Fig. 21) until the gage indicates 0 psi.
4. Turn the calibration screw in the opposite direction until the gage indicates 8 ±1 psi (56 ±7 kPa).
5. With 18 psi (126 kPa) winter main air pressure, repeat Steps 3 and 4 using the winter (right) calibration screw.
   NOTE: If the thermostat has a setpoint dial (Fig. 21), it must be set to the indicated temperature before returning to Steps 3 and 4.
6. The thermostat is now in calibration.
7. Remove the gage and replace the cover.

95-7255

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