T874R Thermostats and Q674L Subbases

Installation Instructions for the Trained Service Technician.

TRADELINE®

INSTALLATION INSTRUCTIONS

APPLICATION

The T874R Thermostat and Q674L Subbase provide 24 to 30 Vac control of 2-stage heating and 1-stage cool-ing heat pump systems with manual changeover. Q674L Subbase provides EM.HT.-HEAT-OFF-COOL system switching and AUTO-ON fan switching. See Table 1 for specific T874R/Q674L combinations.

Table 1. Thermostat/Subbase Specifications.

Thermostat/ Subbase Package	Thermostat/ Subbase Model Numbers	LED Indication	Changeover	Comments	See Fig.
Y594R1243	T874R1152/ Q674L1207	AUX.HT., EM. HT.	Manual Cool	TRADELINE®; adjustable stage 2 heat anticipation. Fixed anticipation in stage 1. Auto fan in EM.HT.	6
Y594R1300	T874R1475/ Q674L1520	AUX.HT., EM. HT.[a]	Manual Heat or Cool	TRADELINE®; fixed heat anticipation. Auto fan in EM.HT.	7
Y594R1425	T874R1616/ Q674L1587	AUX.HT., EM. HT., CHECK	Manual Heat or Cool	SUPER TRADELINE®; fixed heat anticipation. Factory installed jumper across W1 and Y1. Auto fan in EM.HT.	8
Y594R1615	T874R1822/ Q674L1710	AUX.HT., EM. HT., CHECK	Manual Heat or Cool	TRADELINE®; fixed heat anticipation. Auto fan in EM.HT.	10
Y594R1664	T874R1871/ Q674L1736	EM. HT.	Manual Cool	TRADELINE®; exact replacement for York model no. 2TH11702224.	9
Y594R1672	T874R1889/ Q674L1736	EM. HT.	Manual Cool	TRADELINE®; exact replacement for York model nos. 2TH11702324 and 6TH11702224.	11
Y594R1698[b]	T874R1905/ Q674L1777	EM. HT.	Manual Cool	TRADELINE®; exact replacement for York model nos. 2TH11702324 and 6TH11702224. Includes C815A1054 Outdoor Thermistor.	11
Y594R1706[b]	T874R1913/ Q674L1777	EM. HT.	Manual Cool	TRADELINE®; exact replacement for York model no. 2TH11702224.	9
Y594R1763	T874R1954/ Q674L1827	AUX.HT., EM. HT.[a]	Manual Cool	Requires C815A Outdoor Thermister for outdoor reset. Fixed stage 1 heat anticipation. No heat anticipation in stage 2 heat. Auto fan in EM.HT. Replaces Y594R1136.	5
Y594R1797	T874R1988/ Q674L1868	AUX.HT., EM.HT.	Manual Heat or Cool	TRADELINE®	12

[a] EM.HT. LED also shows compressor malfunction.
[b] Premier White® color.

OPERATION

On a 2-heat thermostat, the two stages of heat *make* sequentially as the temperature drops. *Make* refers to the mercury switch initiating a call for heat or cool.

There is about 1° F (0.6° C) between stages so the second stage makes only when the first stage can not handle the load. The 1° F (0.6° C) is referred to as the *interstage differential*.

The light emitting diodes (LED) on the subbase light when something specific happens within the system. When an LED lights, refer to this list for the meaning:

EM. HT.: Emergency heat is operating. The compressor has failed, and the heat pump is not operating. LED lights when system switch is placed in the EM.HT. position by the homeowner.

AUX.HT.: Auxiliary heat is operating, which means the weather is so cold that the heat pump cannot handle the load.

CHECK: System needs to be checked. See heating sys-tem instructions for specific meaning.

NOTE: LEDs are not field replaceable or addable.

RECYCLING NOTICE

This control contains mercury in a sealed tube. Do n*ot* place control in the trash at the end of its useful life.

If this control is replacing a control that contains mer-cury in a sealed tube, do *not* place your old control in the trash.

Contact your local waste management authority for instructions regarding recycling and the proper disposal of this control, or of an old control containing mercury in a sealed tube.

INSTALLATION

When Installing this Product…

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

CAUTION

1. Disconnect power supply to prevent electrical shock or equipment damage.
2. To prevent interference with the thermostat linkage, keep wire length to a minimum and run wires as close as possible to the subbase.
3. Push excess wire back into the hole and plug hole to prevent drafts from affecting thermostat operation.
4. Do not overtighten thermostat captive mounting screws because damage to subbase threads can result.
5. Do not short across coil terminals on heating relay or gas valve. This can burn out the thermostat heat anticipator.
6. Never install more than one wire per terminal unless factory-supplied jumper with spade terminals is used.

IMPORTANT

Thermostats are calibrated at the factory using subbase mounted at true level. Inaccurate subbase leveling causes the actual temperature to deviate from the setpoint temperature.

Location

Install the thermostat about 5 ft (1.5m) above the floor in an area with good air circulation at average temperature. Do not install the thermostat where it can be affected by:

— drafts or dead spots behind doors and in corners.
— hot or cold air from ducts.
— radiant heat from sun or appliances.
— concealed pipes and chimneys.
— unheated (uncooled) areas such as an outside wall behind the thermostat.

Mounting The Subbase

The thermostat subbase can be mounted on a vertical outlet box, horizontal outlet box or directly on the wall.

1. If you must mount the subbase on a vertical outlet box, order Honeywell 193121A Adapter Assembly. See Fig. 1. The assembly includes an adapter ring, two screws and a cover plate to cover marks on the wall. Install the ring and cover plate on the vertical outlet box.

   For a wall installation, hold subbase in position and mark holes for anchors. See Fig. 2. Obtain wall anchors locally. Be careful that the wires do not fall back into the wall opening. Set aside subbase. Drill two 3/16 in. (5 mm) holes and gently tap anchors into the holes until flush with the wall.

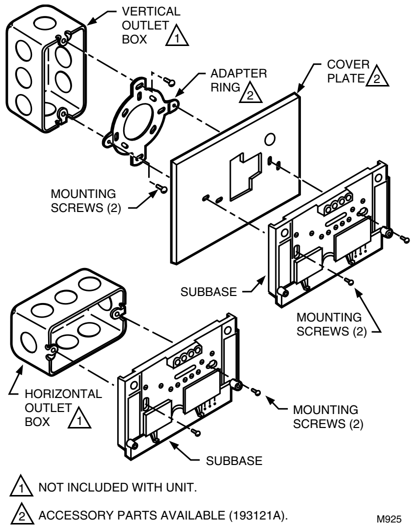

Fig. 1. Installation of subbase on outlet box.

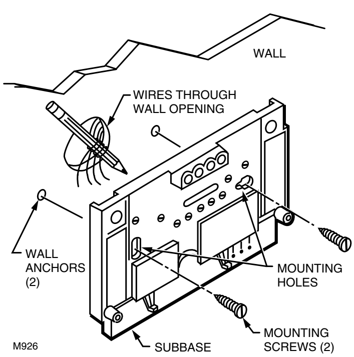

Fig. 2. Installation of subbase on wall.

2. Run wires to the thermostat location.
3. Pull wires through the cover plate (if used) and sub-base cable opening. See Fig. 3.

IMPORTANT

Use 18 gauge, color-coded thermostat cable for proper wiring.

4. Secure the cover plate (if used) and subbase with the screws provided. Do not fully tighten the subbase screws.
5. Level the subbase by using a spirit level. Firmly tighten subbase mounting screws. See Fig. 3. The subbase mounting holes provide for minor out-of-level adjustments.

IMPORTANT

An incorrectly leveled subbase causes the temperature control to deviate from setpoint.

Wiring the Subbase

All wiring must comply with local electrical codes and ordinances. Follow equipment manufacturer wiring instructions when available. To wire subbase, proceed as follows:

1. Connect the system wires to the subbase. See Fig. 5-12. A letter code for identification is located near each terminal. The terminal barrier permits straight or conventional wraparound wiring connection. See Fig. 4.
2. Firmly tighten each terminal screw.
3. Fit wires as close as possible to the subbase. Push excess wire back into the hole.
4. Plug the hole with nonflammable insulation to prevent drafts from affecting the thermostat.

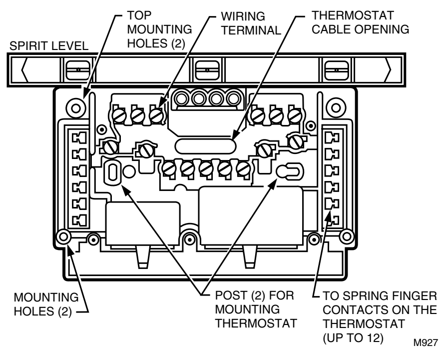

Fig. 3. Subbase components and leveling procedure.

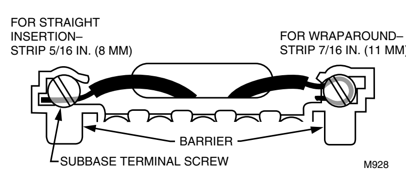

Fig. 4. Wiring connections.

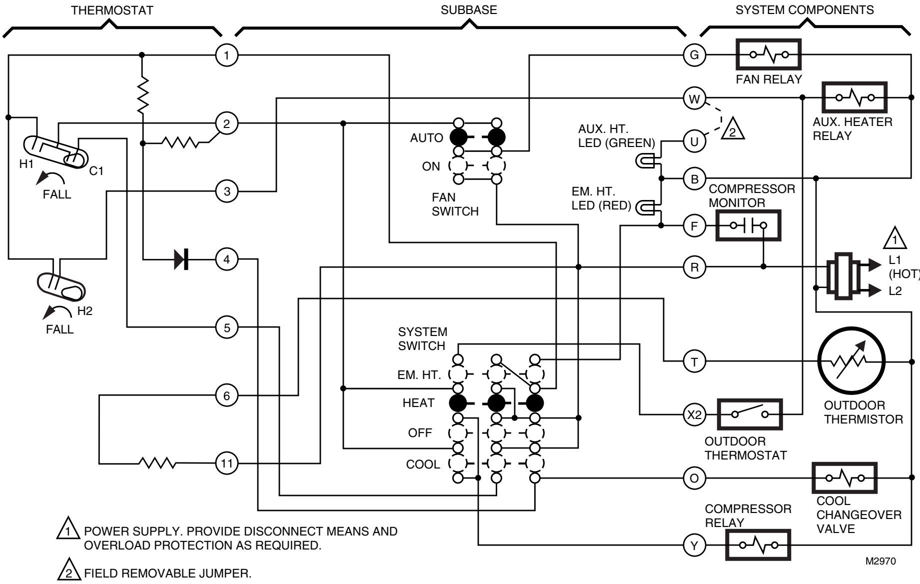

Fig. 5. Internal schematic and typical wiring diagram for Y594R1763 (T874R1954/Q674L1827). Replaces GE AY28X078, AY28X139; Trane Baystat 139, Baystat 239 and Baystat 240; and Honeywell Y594R1136 Thermostats.

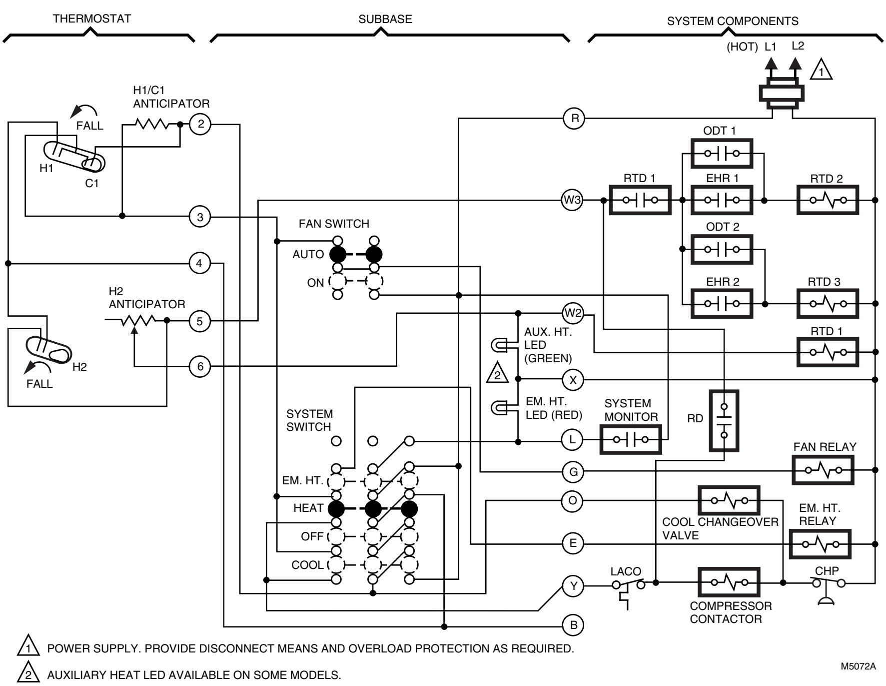

Fig. 6. Internal schematic and typical wiring diagram for Y594R1243 (T874R1152/Q674L1207).

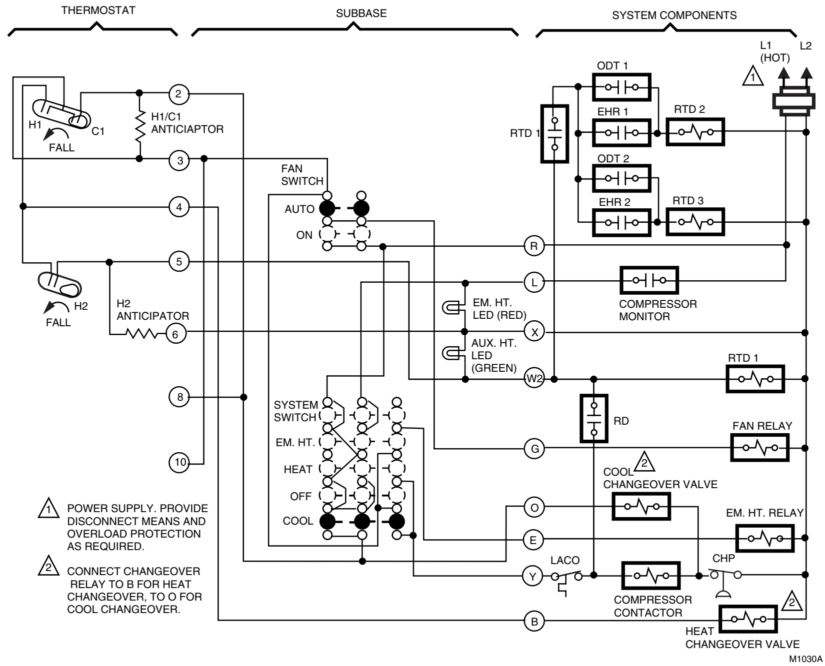

Fig. 7. Internal schematic and typical wiring diagram for Y594R1300 (T874R1475/Q674L1520); fixed anticipation.

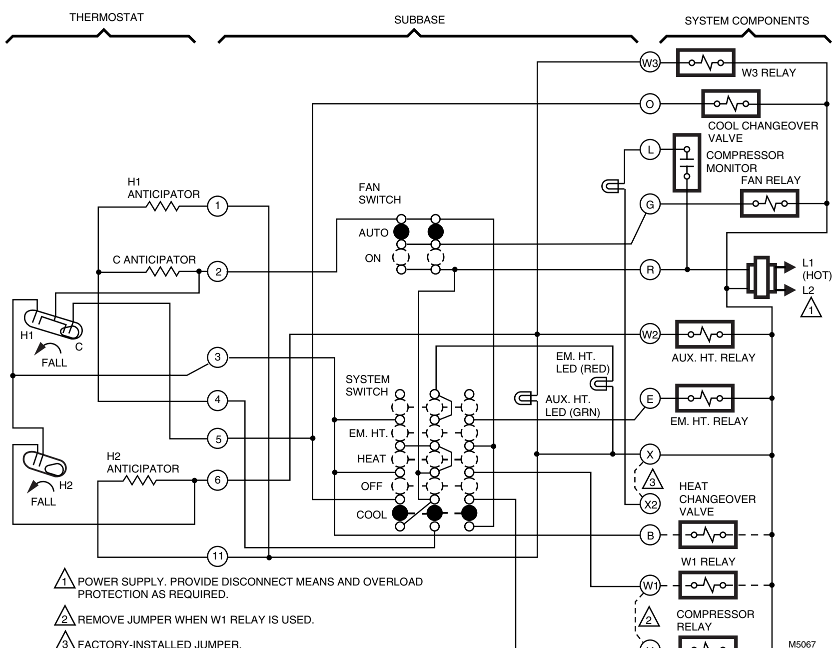

Fig. 8. Internal schematic and typical wiring diagram for Y594R1425 (T874R1616/Q674L1587). SUPER TRADELINE®; universal model for heat, cool, or first stage heating changeover systems. CHECK LED has isolated terminals for use in all systems.

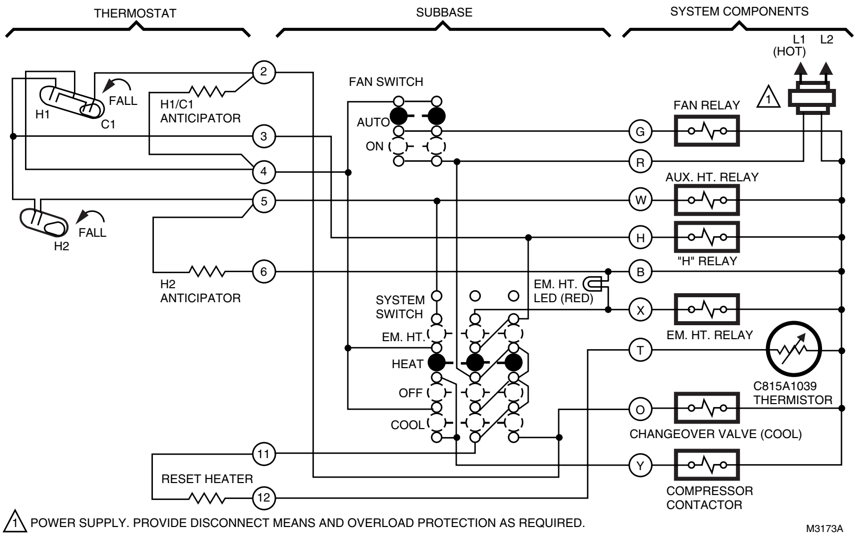

Fig. 9. Internal schematic and typical wiring diagram for Y594R1664 (T874R1871/Q674L1736) and Y594R1706 (T874R1913/Q674L1777). Exact replacement for York model no. 2TH11702224.

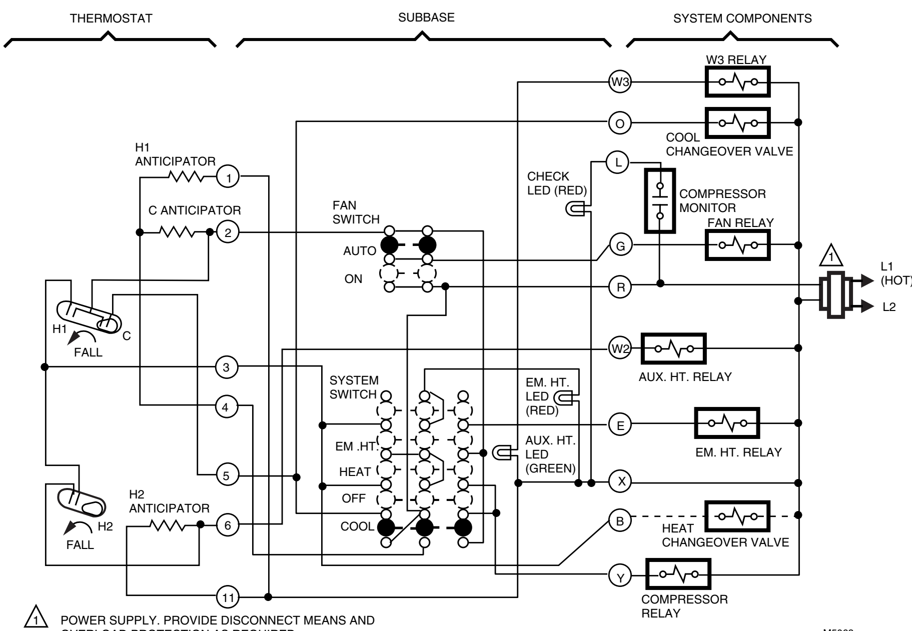

Fig. 10. Internal schematic and typical wiring diagram for Y594R1615 (T874R1822/Q674L1710). TRADELINE; intended for use in applications where W2 and E terminals are not jumpered.

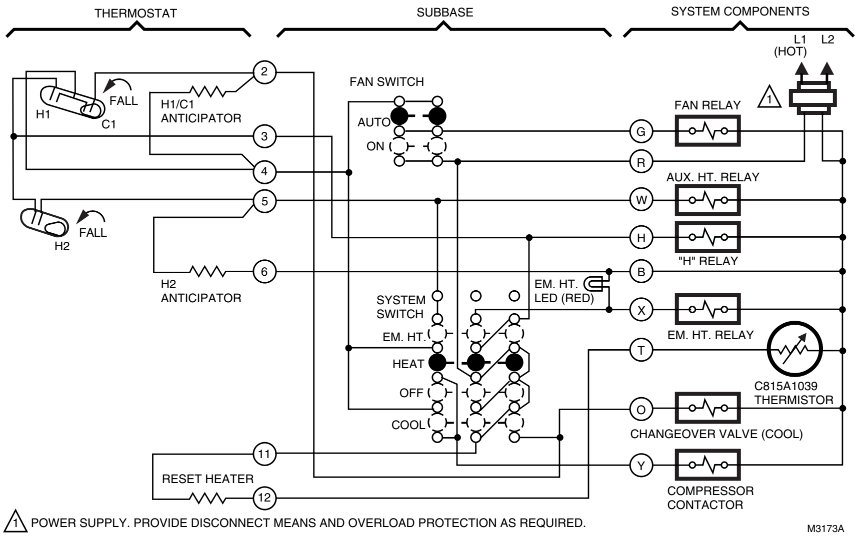

Fig. 11. Internal schematic and typical wiring diagram for Y594R1672 (T874R1889/Q674L1736) and Y594R1698 (T874R1905/Q674L1777). Exact replacement for York model nos. 2TH11702324 and 6TH11702224.

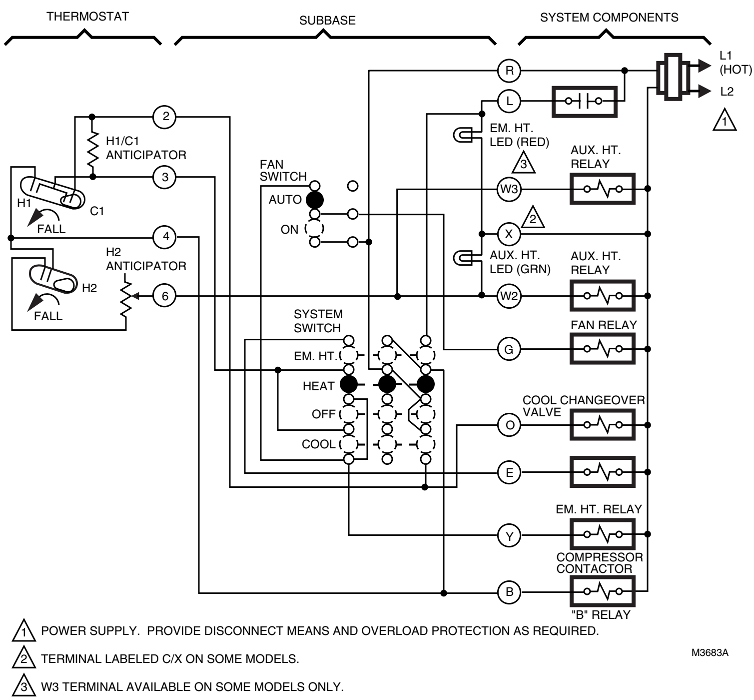

Fig. 12. Internal schematic and typical wiring diagram for Y594R1797 (T874R1988/Q674L1868).

Mounting the Thermostat

1. Remove the thermostat cover by pulling the bottom edge of the cover away from the base until it snaps free from the cover clip.

   NOTE: The cover is hinged at the top and can be removed by pulling out at the bottom.

2. Carefully remove and discard polystyrene packing insert that protects the mercury switches during shipment.
3. Turn over the thermostat base and note the spring fingers that engage the subbase contacts. Make sure the spring fingers are *not* bent flat, preventing proper electrical contact with the subbase.
4. Note the two tabs on the top inside edge of the thermostat base. The tabs fit into corresponding slots on the top of the subbase. Mount the thermostat on the subbase.
5. Align the two captive mounting screws in the thermostat base with the posts on the subbase. See Fig. 13. Tighten both screws. *Do not overtighten screws* or damage to subbase posts can result.
6. Hang the upper edge of the thermostat cover on top of the thermostat base and swing cover downward until it engages with the cover clip.

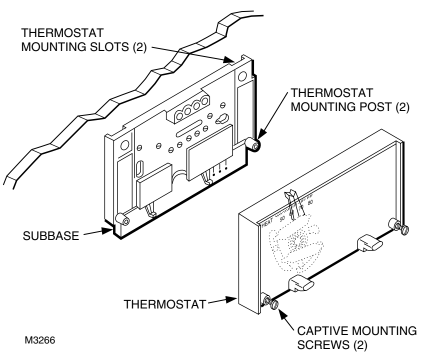

Fig. 13. Mounting thermostat on subbase.

SETTINGS

⚠ CAUTION

On systems using a gas valve, never apply a jumper across the valve coil terminals, even temporarily. This can burn out the thermostat heat anticipator(s).

Heat Anticipator Setting
(2nd Stage Y594R1243)

Set the heat anticipator scale to match the primary control current draw. When using a T874 Thermostat with two stages of heating, set the heat anticipator to match the respective primary control current draw. If the primary control nameplate has no rating or if further adjustment is necessary, use the following procedure to determine the current draw. Measure the current draw with the thermostat removed and the power on.

1. Connect an ac ammeter of appropriate range between the heating terminals of the subbase:
   Stage 2: between W2 and R.
2. Move the system switch to HEAT.
3. After one minute, read the ammeter and record the reading:
   Stage 2: _______________amperes.
4. After mounting the thermostat, set the adjustable heat anticipator to match the respective reading measured in step 3.

If equipment cycles too fast, set the anticipator to a higher current rating, not more than one-half division at a time, and recheck cycle rate. Most conventional 2-stage heating equipment is designed to operate at 3 cycles per hour per stage. See Fig. 14.

Most heat pump systems should cycle 2-1/2 to 3 times per hour.

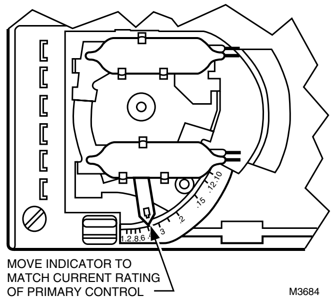

Fig. 14. Adjustable heat anticipator scale.

Temperature Setting

Move the setpoint lever to the desired comfort position. One lever controls both heating and cooling.

Subbase Setting

System switching positions control thermostat operation as follows:

OFF: Heating and cooling systems are off. If the fan switch is at the AUTO position, the cooling fan is also off.
HEAT: Heating system is controlled by the thermostat. Cooling system is off.
COOL: Cooling system is controlled by the thermostat. Heating system is off.
EM.HT.: Emergency heat relay is energized on call for heat. Cooling system is off. Compressor is de-energized.

Fan switching positions control fan operation as follows:
ON: Fan operates continuously.
AUTO: Fan operates as controlled by the thermostat.

To switch positions, use thumb and index finger to slide lever to desired position. Stop switch lever in detent directly over the desired function indicator mark for proper circuit operation.

CHECKOUT

Heating
Move the system switch on the Q674 Subbase to HEAT. Move the setpoint lever on the T874 Thermostat about 10° F (6° C) above room temperature. Both stages of heating and the fan should start. Move the setpoint lever about 10° F (6° C) below room temperature. Heating and fan should shut off.

NOTE: To prevent compressor short cycling, some manufacturer equipment includes a minimum-off timer to provide a five-minute time delay before turning on the compressor after the thermostat last turned off the compressor, or after the system first received power. This delay protects the compressor.

Cooling

⚠ CAUTION
Do not operate cooling if the outdoor temperature is below 50° F (10° C). Refer to manufacturer recommendations.

Move the system switch on the Q674 Subbase to COOL. Move the setpoint lever on the T874 Thermostat about 10° F (6° C) below room temperature. Cooling and fan should start (see NOTE above). Move the setpoint lever about 10° F (6° C) above room temperature. Cooling and fan should stop.

Emergency Heat
Move the system switch to EM.HT. The EM.HT. LED should come on. Move the setpoint lever about 10° F (6° C) above room temperature. The electric strip heater(s) should come on. Move the setpoint lever about 10° F (6° C) below room temperature. The electric strip heater should de-energize. The EM.HT. LED remains on until system switch is moved to another position.

Fan
Move the subbase system switch to OFF and the fan switch to ON. The fan should run continuously. When the fan switch is in the AUTO position, fan operation is controlled by the heating or cooling system.

CALIBRATION

Thermostat
T874 Thermostats are accurately calibrated at the factory. *There is no provision for field calibration.*

Thermometer
The thermometer in the thermostat has been accurately calibrated at the factory. The thermometer should need adjustment only if it was dropped or shifted due to mishandling.

If the setpoint lever and the thermometer reading do not agree:
1. Remove the thermostat cover by pulling out from the bottom of cover until it clears the mounting slots.
2. Set the thermostat cover on a table near an accurate thermometer.
3. Allow 10 or 15 minutes for cover thermometer to sense area temperature; compare the readings. Be careful not to touch thermometer or breathe on it.
4. If the readings are the same, replace cover and put the system into operation.
5. If the readings are different, insert a small screwdriver into the thermometer and turn it until the thermometers have the same reading. See Fig. 15.
6. Replace thermostat cover and put the system into operation.

NOTE: Radiant heat from hands offsets the thermometer reading. After making each adjustment, wait 10 or 15 minutes for the thermometer to stabilize before comparing.

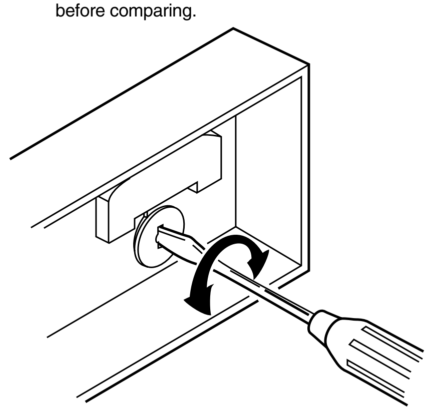

Fig. 15. Thermometer calibration

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