

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 before beginning installation to prevent electrical shock and equipment damage.
2. Accidental shorting of terminal 1 on the W974 to the transformer secondary will cause component failure.
3. Do not use terminals 15 and 16 when terminal 17 is used. Equipment damage will result.

IMPORTANT

The transformer used to power the W973 panel can be used to power a W974 module provided that the VA rating of the transformer is not exceeded. Never ground the secondary of any transformer used to power a W974 module.

LOCATION AND MOUNTING

The W974 can be mounted in any position on a flat wall or panel. Mount the module with two No. 8 screws (not provided) through the mounting holes in the base.

If the optional metal cover (see Accessories) is used, allow at least 3 in. [76.2 mm] clearance above the module to remove the cover for checkout or service.

WIRING

All wiring must comply with applicable local electrical codes, ordinances, and regulations. Disconnect the power supply before connecting wiring. Figs. 2-9 show wiring connections for the W974.

Internal circuitry of W974 models is shown in Fig. 2 (W974A), and in Fig. 3 (W974B).

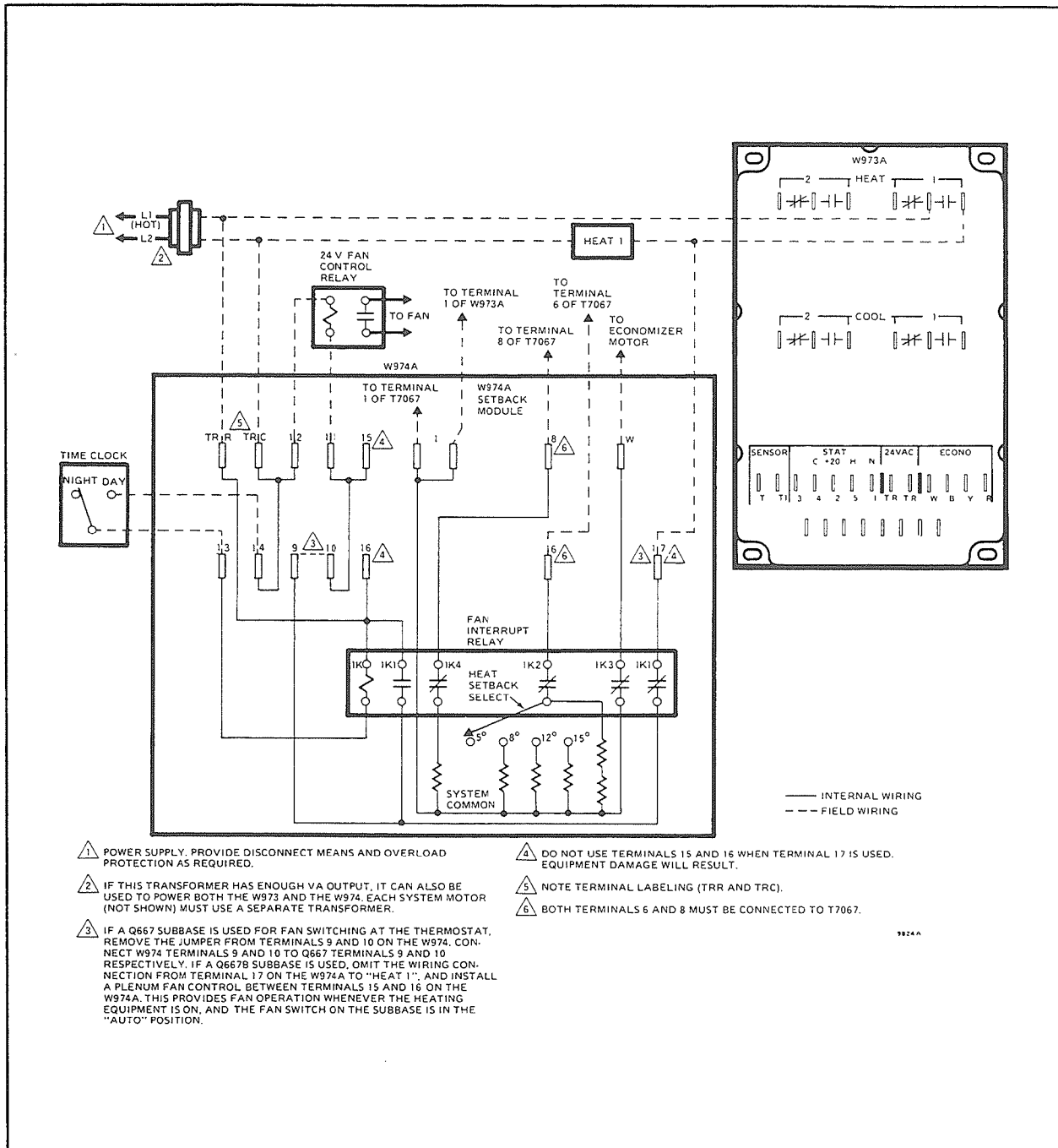
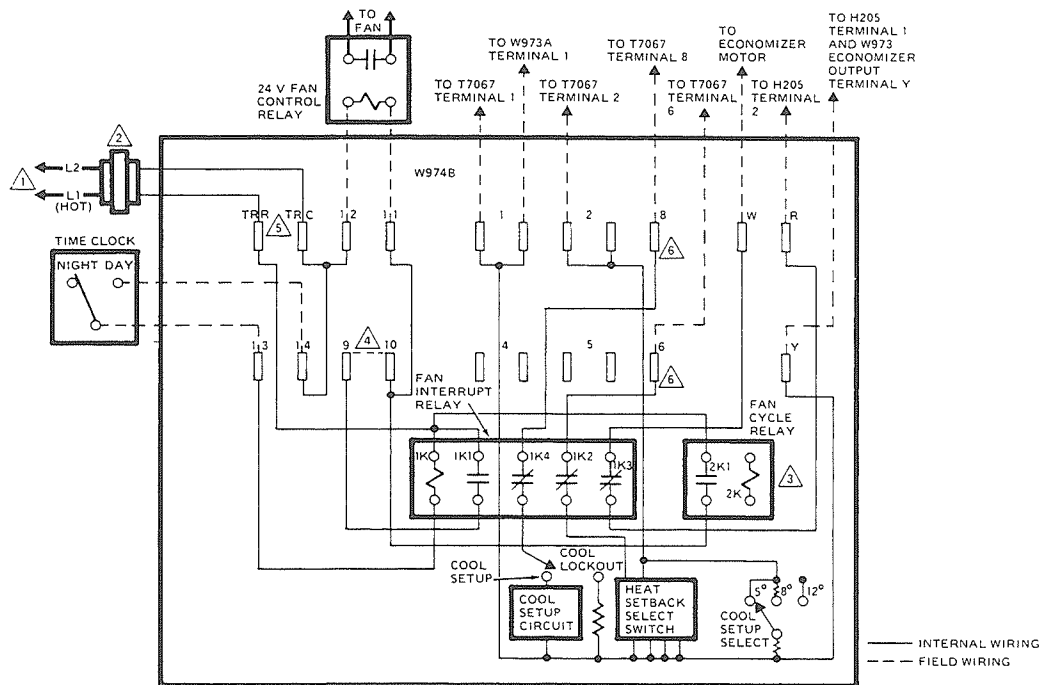


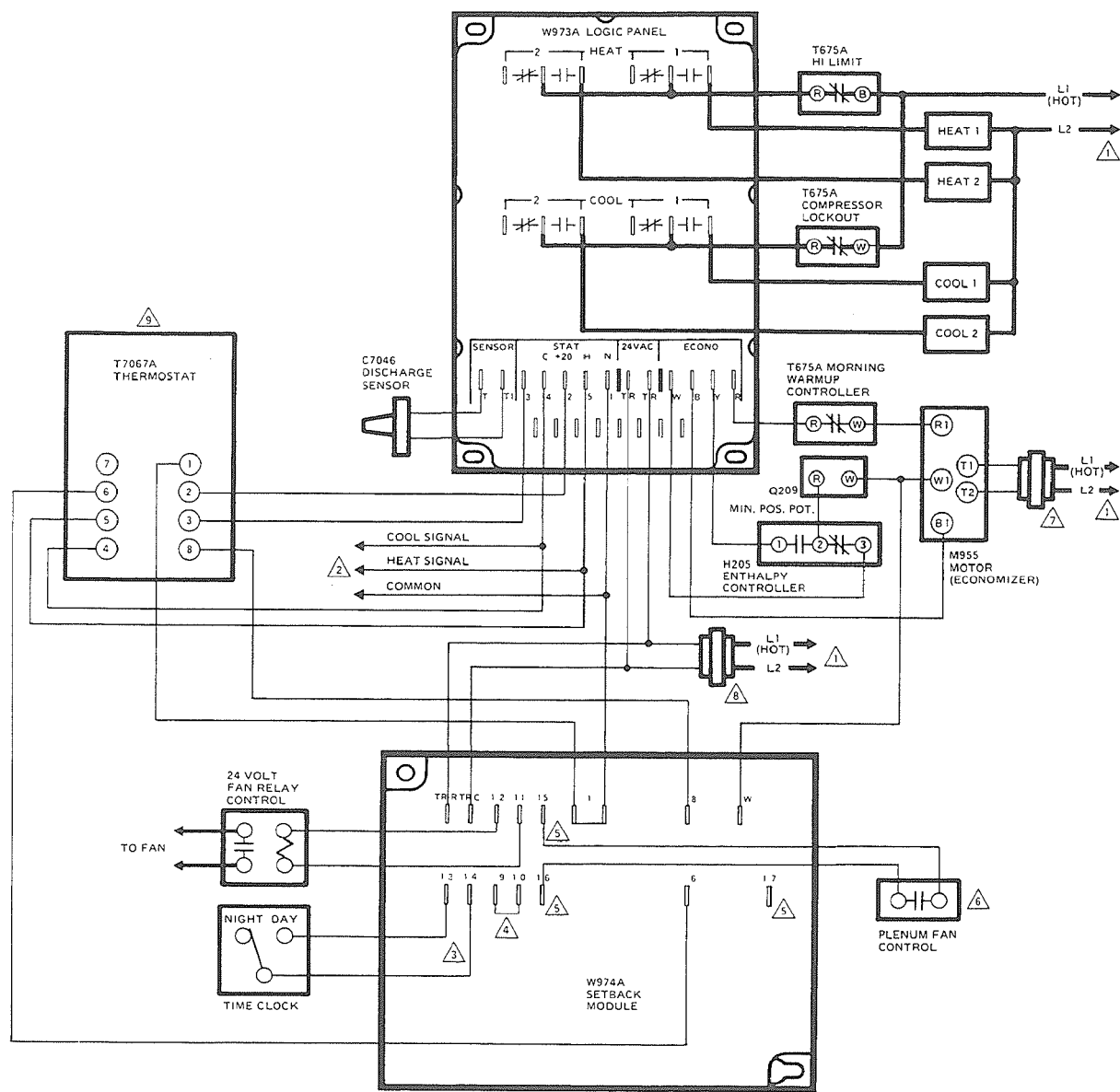
FIG. 2—W974A INTERNAL CIRCUITRY.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 IF THIS TRANSFORMER HAS ENOUGH VA OUTPUT, IT CAN ALSO BE USED TO POWER BOTH THE W973 AND THE W974.
- 3 THE FAN CYCLE RELAY IS ENERGIZED WITH A CALL FOR HEATING, OR IF COOLING SETUP IS SELECTED, THE FAN CYCLE RELAY WILL ALSO CYCLE WITH A CALL FOR COOLING.
- 4 IF A Q667 SUBBASE IS USED FOR FAN SWITCHING AT THE THERMOSTAT, REMOVE THE JUMPER FROM TERMINALS 9 AND 10 ON THE W974. CONNECT W974 TERMINALS 9 AND 10 TO Q667 TERMINALS 9 AND 10 RESPECTIVELY.
- 5 NOTE TERMINAL LABELING (TRR AND TRC).
- 6 BOTH TERMINALS 6 AND 8 MUST BE CONNECTED TO T7067.

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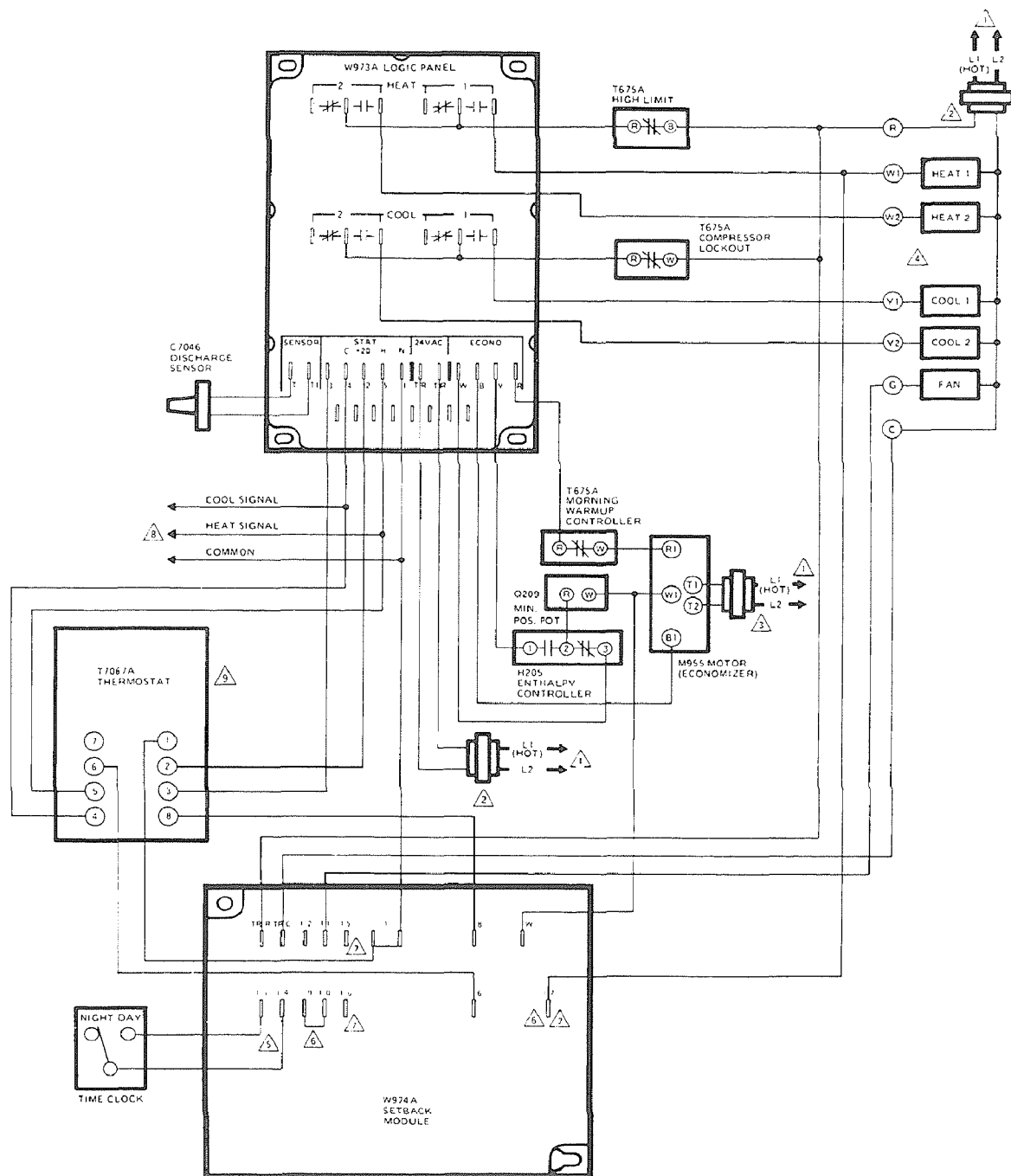
FIG. 3-W974B INTERNAL CIRCUITRY.



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 WIRING FOR W975 SATELLITE SEQUENCERS OR W973 SLAVE PANELS.
- 3 IF MULTIPLE W974'S ARE RUN FROM ONE TIME CLOCK, EACH W974 MUST HAVE ITS OWN ISOLATED SET OF TIME CLOCK CONTACTS. USE MULTIPLE POLE RELAY IF NECESSARY.
- 4 IF A Q667 SUBBASE IS USED FOR FAN SWITCHING AT THE THERMOSTAT, REMOVE THE JUMPER FROM TERMINALS 9 AND 10 ON THE W974. CONNECT W974 TERMINALS 9 AND 10 TO Q667 TERMINALS 9 AND 10 RESPECTIVELY.
- 5 TERMINALS 15 AND 16 MUST NOT BE USED WHEN TERMINAL 17 IS USED. EQUIPMENT DAMAGE WILL RESULT.
- 6 N.O. (NORMALLY OPEN) CONTACTS OF A RELAY WIRED IN PARALLEL WITH HEAT 1 LOAD MAY BE USED IN PLACE OF PLENUM FAN CONTROL.
- 7 SEPARATE TRANSFORMER MUST BE USED FOR THE M955.
- 8 W973, W974, AND W975 DEVICES CAN ALL USE THE SAME TRANSFORMER, PROVIDED THE TRANSFORMER HAS ENOUGH VA OUTPUT TO POWER THE WHOLE SYSTEM.
- 9 WHEN USING T7067B THERMOSTAT, CONNECT REMOTE SENSOR TO TERMINALS 6 AND 7. ALL OTHER CONNECTIONS SAME AS T7067A.

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FIG. 4—WIRING DIAGRAM OF W974A SETBACK MODULE—IN LINE VOLTAGE CONTROL CIRCUITS. (TIME CLOCK CONTACTS ARE CLOSED DURING OCCUPIED PERIOD.)

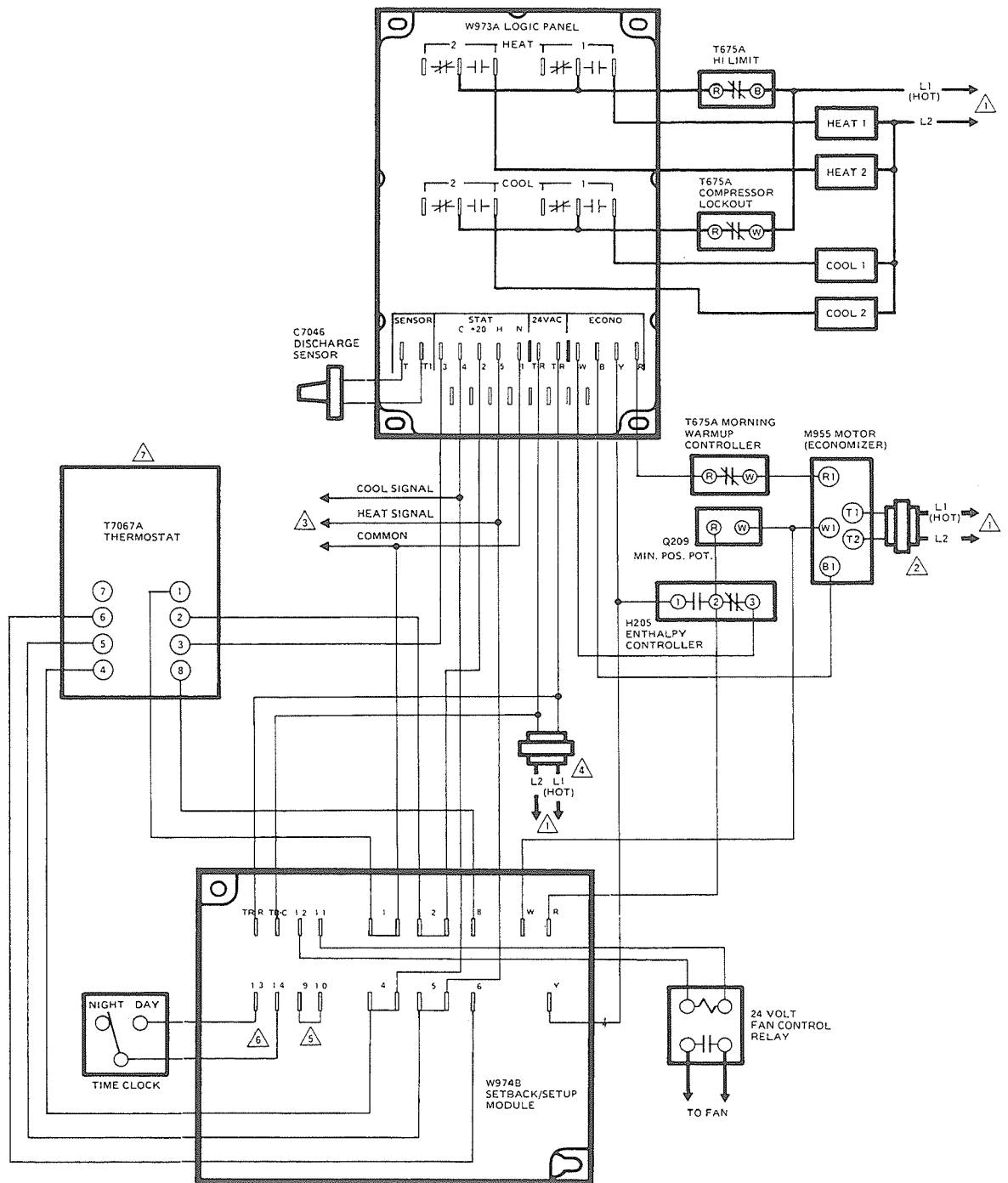


- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 W973, W974, AND W975 DEVICES CAN ALL USE THE SAME TRANSFORMER, PROVIDED THE TRANSFORMER HAS ENOUGH VA OUTPUT TO POWER THE WHOLE SYSTEM.
- 3 SEPARATE TRANSFORMER MUST BE USED FOR THE M955.
- 4 TYPICAL INTERNAL CIRCUIT OF HVAC EQUIPMENT. HEAT AND COOL BOXES REPRESENT VALVES' RELAYS, OR OTHER 24 VOLT AC DEVICES WHICH CONTROL HEATING AND COOLING OUTPUT. FAN BOX REPRESENTS 24 VOLT AC FAN RELAY OR FAN STARTER COIL.
- 5 IF MULTIPLE W974'S ARE RUN FROM ONE TIME CLOCK, EACH W974 MUST HAVE ITS OWN ISOLATED SET OF TIME CLOCK CONTACTS. USE MULTIPLE POLE RELAY IF NECESSARY.

- 6 IF A Q667 SUBBASE IS USED FOR FAN SWITCHING AT THE THERMOSTAT, REMOVE THE JUMPER FROM TERMINALS 9 AND 10 ON THE W974. CONNECT W974 TERMINALS 9 AND 10 TO Q667 TERMINALS 9 AND 10 RESPECTIVELY. IF A Q667B SUBBASE IS USED, OMIT THE WIRING CONNECTION FROM TERMINAL 17 ON THE W974A TO "HEAT 1", AND INSTALL A PLENUM FAN CONTROL CONTACTOR BETWEEN TERMINALS 15 AND 16 ON THE W974A. (SEE WIRING AND NOTE 6 ON FIG. 2.) THIS PROVIDES FAN OPERATION WHENEVER THE HEATING EQUIPMENT IS ON, AND THE FAN SWITCH ON THE SUBBASE IS IN THE "AUTO" POSITION.
- 7 TERMINALS 15 AND 16 MUST NOT BE USED WHEN TERMINAL 17 IS USED. EQUIPMENT DAMAGE WILL RESULT.
- 8 WIRING FOR W975 SATELLITE SEQUENCERS OR W973 SLAVE PANELS.
- 9 WHEN USING T7067B THERMOSTAT, CONNECT REMOTE SENSOR TO TERMINALS 6 AND 7. ALL OTHERS CONNECTIONS SAME AS T7067A.

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FIG. 6—WIRING DIAGRAM FOR W974A SETBACK MODULE IN 24 V CONTROL CIRCUITS.

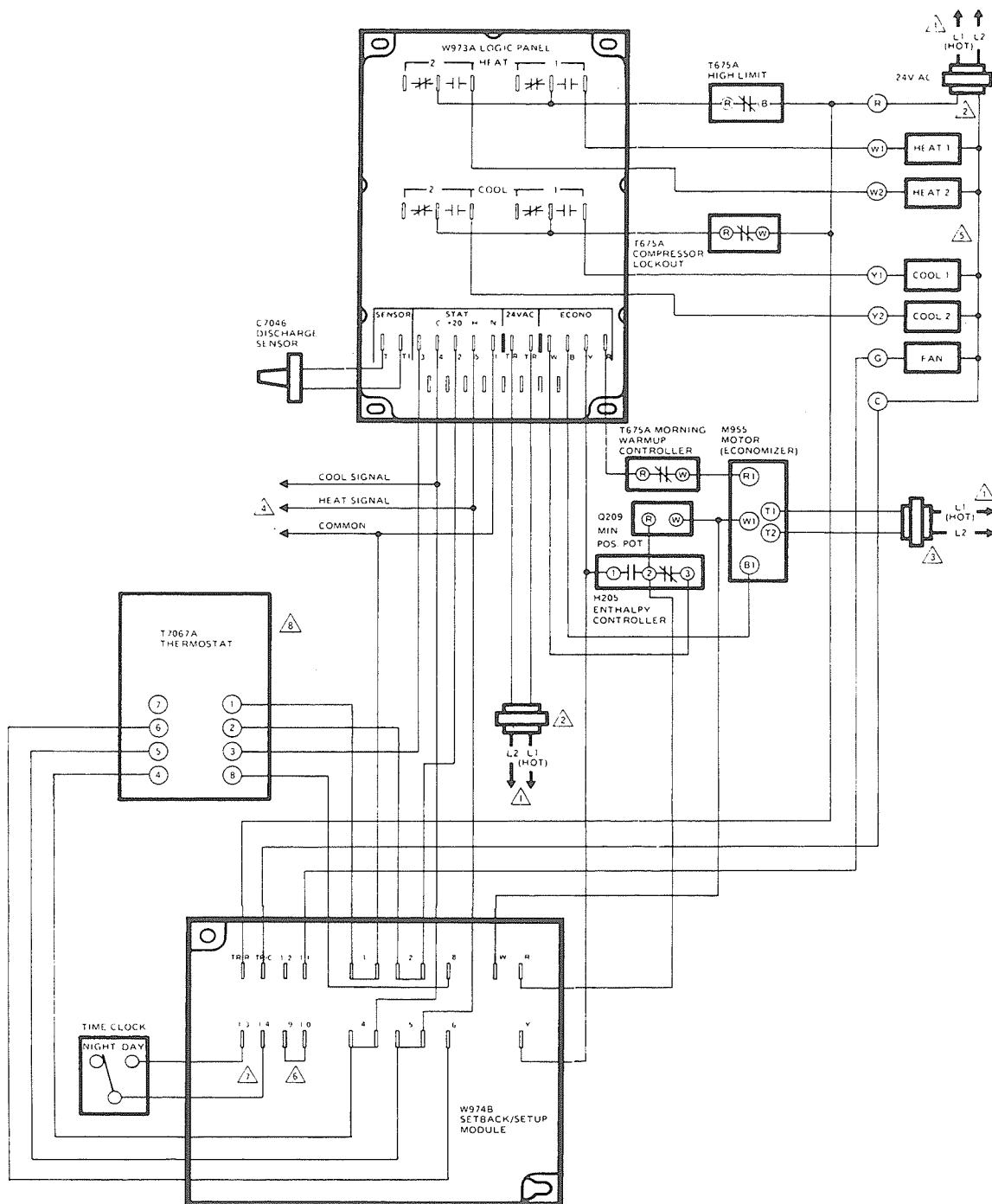


- 1 POWER SUPPLY, PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 SEPARATE TRANSFORMER MUST BE USED FOR THE M955.
- 3 WIRING FOR W975 SATELLITE SEQUENCERS OR W973 SLAVE PANELS.
- 4 W973, W974, AND W975 DEVICES CAN ALL USE THE SAME TRANSFORMER, PROVIDED THE TRANSFORMER HAS ENOUGH VA OUTPUT TO POWER THE WHOLE SYSTEM.

- 5 IF A Q667 SUBBASE IS USED FOR FAN SWITCHING AT THE THERMOSTAT, REMOVE THE JUMPER FROM TERMINALS 9 AND 10 ON THE W974. CONNECT W974 TERMINALS 9 AND 10 TO Q667 TERMINALS 9 AND 10 RESPECTIVELY.
- 6 IF MULTIPLE W974'S ARE RUN FROM ONE TIME CLOCK, EACH W974 MUST HAVE ITS OWN ISOLATED SET OF TIME CLOCK CONTACTS. USE MULTIPLE POLE RELAY IF NECESSARY.
- 7 WHEN USING T7067B THERMOSTAT, CONNECT REMOTE SENSOR TO TERMINALS 6 AND 7. ALL OTHER CONNECTIONS SAME AS T7067A.

44990

FIG. 7—WIRING DIAGRAM FOR W974B SETBACK MODULE IN LINE VOLTAGE CONTROL CIRCUITS. (TIME CLOCK CONTACTS CLOSED DURING OCCUPIED PERIOD.)



- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 W973, W974, AND W975 DEVICES CAN ALL USE THE SAME TRANSFORMER, PROVIDED THE TRANSFORMER HAS ENOUGH VA OUTPUT TO POWER THE WHOLE SYSTEM.
- 3 SEPARATE TRANSFORMER MUST BE USED FOR THE M955.
- 4 WIRING FOR W975 SATELLITE SEQUENCERS OR W973 SLAVE PANELS.
- 5 TYPICAL INTERNAL CIRCUIT OF HVAC EQUIPMENT. HEAT AND COOL BOXES REPRESENT VALVES, RELAYS, OR OTHER 24 VOLT AC DEVICES WHICH CONTROL HEATING AND COOLING OUTPUT. FAN BOX REPRESENTS 24 VOLT AC FAN RELAY OR FAN STARTER COIL.

- 6 IF A Q667 SUBBASE IS USED FOR FAN SWITCHING AT THE THERMOSTAT, REMOVE THE JUMPER FROM TERMINALS 9 AND 10 ON THE W974. CONNECT W974 TERMINALS 9 AND 10 TO Q667 TERMINALS 9 AND 10 RESPECTIVELY.
- 7 IF MULTIPLE W974'S ARE RUN FROM ONE TIME CLOCK, EACH W974 MUST HAVE ITS OWN SET OF ISOLATED TIME CLOCK CONTACTS. USE MULTIPLE POLE RELAY IF NECESSARY.
- 8 WHEN USING T7067B THERMOSTAT, CONNECT REMOTE SENSOR TO TERMINALS 6 AND 7. ALL OTHER CONNECTIONS SAME AS T7067A.

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FIG. 8—WIRING DIAGRAM FOR THE W974B SETBACK/SETUP MODULE IN 24 V CONTROL CIRCUITS; TIME CLOCK CONTACTS ARE CLOSED DURING THE OCCUPIED PERIOD.

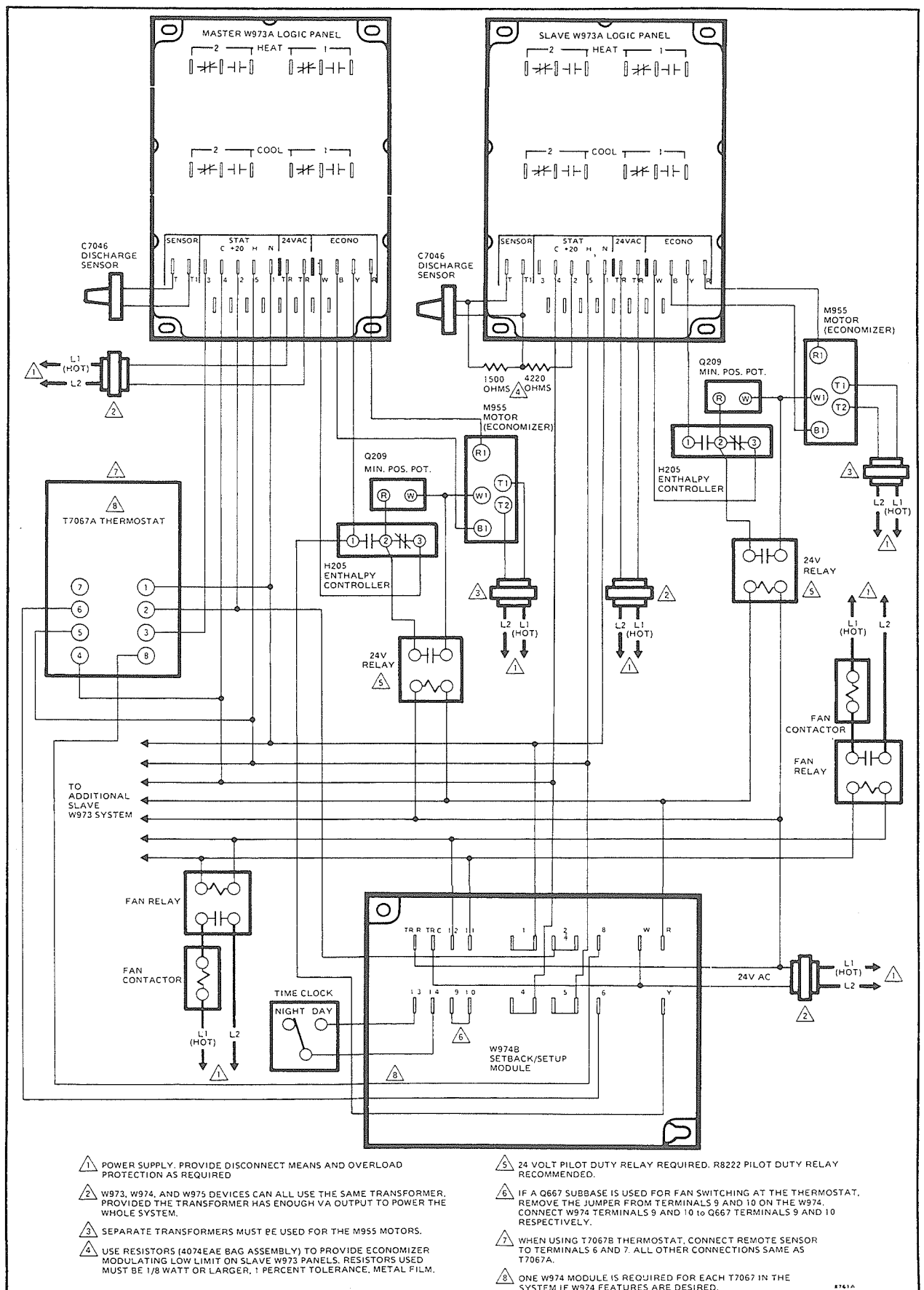


FIG. 9—WIRING DIAGRAM FOR A SINGLE W974B SETBACK/SETUP MODULE IN A MULTIPLE W973 SYSTEM.

OPERATION

The W974A Setback Module provides heating setback and cooling shutdown. The W974B provides heating setback, and either cooling shutdown or cooling setup. The W974 modifies the heat and cool output signals from a T7067 Dual Set Point Thermostat during the unoccupied period.

A separate time clock controls the operating mode of the W974. During the occupied period, the time clock switch is closed. At a preset time, the time clock switch opens to initiate the W974 unoccupied functions. When connected as shown in Figs. 2 through 9, unoccupied operation is as follows.

HEATING SETBACK (W974A AND B)

1. The heating set point is decreased 5, 8, 12, or 15 degrees F [2.8, 4.4, 6.7, or 8.3 degrees C], depending on the W974 setting.
2. The economizer motor drives to its *closed* position.
3. The system fan is switched from continuous to intermittent operation. The fan will cycle with the first stage of heating or, if a plenum control is used with a W974A, when the plenum control fan switch makes.
4. When the system returns to occupied operation, the T675A Morning Warmup Temperature Controller keeps the economizer motor closed until the return air temperature exceeds the selected set point.

COOLING SHUTDOWN/SETUP

W974A (cooling shutdown only)

1. The cooling signal is forced low, shutting down the cooling equipment and system fan.
2. The outdoor air damper is held in its *closed* position.

W974B

COOLING SHUTDOWN

1. The cooling signal is forced low, shutting down the cooling equipment and system fan.
2. The outdoor air damper is held in its *closed* position.

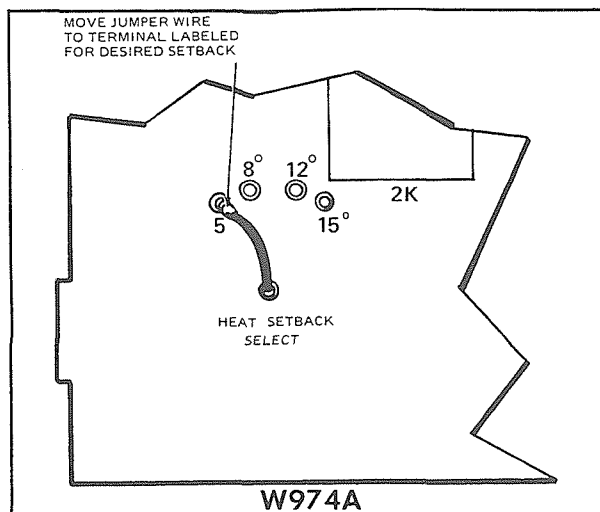
COOLING SETUP

1. The cooling set point is increased 5, 8, or 12 degrees F [2.8, 4.4, or 6.7 degrees C], depending on the W974B setting.
2. The economizer motor drives to its *closed* position until a cooling demand occurs.
3. The system fan cycles with a call for cooling from the T7067 thermostat.
 - a. If the outdoor enthalpy is below the H205 set point: On a call for cooling, the fan starts when the economizer motor starts to open.
 - b. If the outdoor enthalpy is above the H205 set point: On a call for cooling, the economizer motor remains closed. The fan starts when the first stage of mechanical cooling is energized.

SETTINGS AND ADJUSTMENTS

ADJUSTING HEATING SETBACK (Fig. 9)

Heating setback can be adjusted to *decrease* the unoccupied heating control point 5, 8, 12, or 15 degrees F [2.8, 4.4, 6.7, or 8.3 degrees C] *below* the occupied control point.



On the W974A, move the jumper wire designated HEAT SETBACK SELECT to the terminal labeled for the desired amount of setback.

On the W974B, position the HEAT SETBACK SELECT switch for the desired amount of setback.

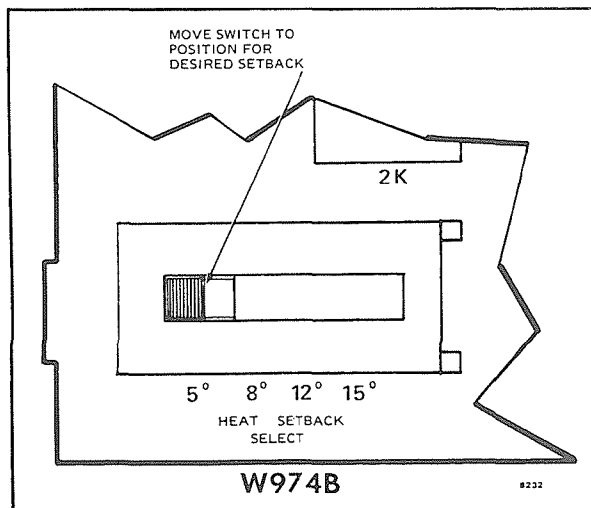


FIG. 10—ADJUSTING THE HEATING SETBACK.

ADJUSTING COOLING SETUP— W974B ONLY (Fig. 10)

The MODE SELECT jumper wire must be on the COOL SETUP terminal. If cooling setup is not desired, move this jumper wire to the COOL LOCKOUT terminal; the cooling equipment will then be shut down during unoccupied operation.

Cooling setup, on W974B only, can be adjusted to increase the unoccupied cooling control point 5, 8, or 12 degrees F [2.8, 4.4, or 6.7 degrees C] above the occupied control point. Move the jumper wire designated COOL SETUP SELECT to the terminal labeled for the desired amount of setup.

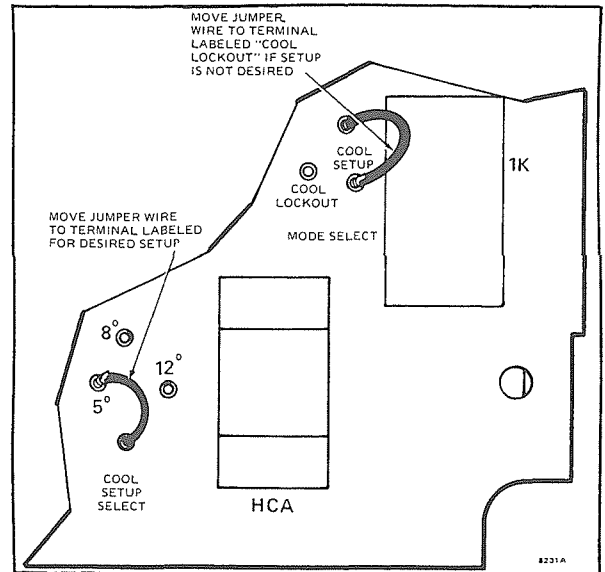


FIG. 11—ADJUSTING THE W974B COOLING SETUP.

CHECKOUT

CAUTION

1. The W974 must be powered when making these checks.
2. Use utmost care to avoid electrical shock while testing the W974.

PROCEDURE

The successful completion of the following checkout procedure determines that:

1. The W974 is functioning properly.
2. The system components are correctly wired to the W974.

This checkout must be performed with the system powered. Perform the checkout of the W973 Logic Panel prior to the checkout of the W974.

W974A

HEATING SETBACK

1. Place the time clock in the *occupied* mode (DAY position).
2. Set the HEAT SETBACK SELECT jumper (Fig. 9) to 15 F [8.3 C].
3. Adjust the T7067 Thermostat heating set point 5 F [2.8 C] above space temperature. If a Q667 Subbase is used, set the system switch to AUTO and the fan switch to ON. With time delay between stages, one or more heating stages should sequence on.
4. Place the time clock in the *unoccupied* mode (NIGHT position, terminals 13, 14 open).
 - a. Heating stages should sequence off.
 - b. The system fan should cycle off with Heat Stage 1. (If an optional plenum fan control is used, the fan should cycle off when the discharge air temperature drops to the plenum fan control FAN-OFF setting.)

- c. The economizer motor should drive to its *closed* position.
5. Return the time clock to the *occupied* mode (DAY position) and set the subbase switches, if used, to the desired positions. Set the T7067 heating set point and W974A HEAT SETBACK SELECT jumper (Fig. 9) to the desired settings.

COOLING SHUTDOWN

1. Place the time clock in the *occupied* mode (DAY position).
2. Set the H205 outside air changeover controller above the outside air enthalpy or jumper H205 out of the circuit.
3. Adjust the T7067 thermostat cooling set point 5 F [2.8 C] below space temperature. If a Q667 Subbase is used, set the system switch to AUTO and the fan switch to ON.
 - a. With time delay between stages, one or more cooling stages should sequence on.
 - b. The economizer motor should drive *open*. (Low limit operation will modulate the economizer toward minimum position if the discharge air temperature drops below 62 F [17 C].)
4. Place the time clock in the *unoccupied* mode (NIGHT position).
 - a. Cooling stages should sequence off.
 - b. The system fan should cycle off.
 - c. The economizer motor should drive to its *closed* position.
5. Return the time clock to the *occupied* mode (DAY position) and set the subbase switches, if used, to the desired positions. Return the T7067 cooling set point and the H205 outside air changeover controller to the desired settings.

W974B

HEATING SETBACK

1. Place the time clock in the *occupied* mode (DAY position).
2. Set the HEAT SETBACK SELECT switch (Fig. 9) to 15 F [8.3 C].
3. Adjust the T7067 Thermostat heating set point 5 F [2.8 C] above space temperature. If a Q667 Subbase is used, set the sysem switch to AUTO and the fan switch to ON. With time delay between stages, one or more heating stages should sequence on.
4. Place the time clock in the *unoccupied* mode (NIGHT position).
 - a. Heating stages should sequence off.
 - b. The system fan should cycle off with HEAT Stage 1.
 - c. The economizer motor should drive to its closed position.
5. Return the time clock to the *occupied* mode (DAY position) and set the subbase switches, if used, to the desired positions. Move the T7067 heating set point and W974B HEAT SETBACK SELECT switch (Fig. 9) to the desired settings.

COOLING SHUTDOWN

1. Place the time clock in the *occupied* mode (DAY position).
2. Set the MODE SELECT jumper (Fig. 10) to COOL LOCKOUT.
3. Set the H205 outside air changeover controller above the outside air enthalpy or jumper H205 out of the circuit.
4. Adjust the T7067 thermostat cooling set point 5 F [2.8 C] below space temperature. If a Q667 Subbase is used, set the system switch to AUTO and the fan switch to ON.
 - a. With time delay between stages, one or more cooling stages should sequence on.
 - b. The economizer motor should drive open. (Low limit operation will modulate the economizer toward minimum position if the discharge air temperature drops below 62 F [17 C].)
5. Place the time clock in the *unoccupied* mode (NIGHT position).
 - a. Cooling stages should sequence off.
 - b. The system fan should cycle off.
 - c. The economizer motor should drive to its closed position.

6. Return the time clock to the *occupied* mode (DAY position) and set the subbase switches, if used, to the desired positions. Return the T7067 cooling set point, the H205 outside air changeover controller, and the W974B MODE SELECT jumper (Fig. 10) to the desired settings.

COOLING SETUP

1. Place the time clock in the *occupied* mode (DAY position).
2. Set the MODE SELECT jumper (Fig. 10) to COOL SETUP.
3. Set the COOL SETUP SELECT jumper (Fig. 10) to 12 F [6.7 C].
4. Set the H205 outside air changeover controller above the outside air enthalpy or jumper H205 out of the circuit.
5. Adjust the T7067 thermostat cooling set point 5 F [2.8 C] below space temperature. If a Q667 Subbase is used, set the system switch to AUTO and the fan switch to ON.
 - a. With time delay between stages, one or more cooling stages should sequence on.
 - b. The economizer motor should drive open. (Low limit operation will modulate the economizer toward minimum position if the discharge air temperature drops below 62 F [17 C].)
6. Place the time clock in the *unoccupied* mode (NIGHT position).
 - a. Cooling stages should sequence off.
 - b. The economizer motor should drive to its closed position.
 - c. The system fan should cycle off as the economizer is closing.
7. Adjust the T7067 thermostat cooling set point 20 F [11 C] below space temperature. With time delay:
 - a. System fan should cycle on.
 - b. Economizer motor should drive open. (Low limit operation will modulate the economizer toward minimum position if the discharge air temperature drops below 62 F [17 C].)
 - c. One or more cooling stages should sequence on.
8. Return the time clock to the *occupied* mode (DAY position) and set the subbase switches, if used, to the desired positions. Move the T7067 cooling set point, the H205 outside air changeover controller, the W974B MODE SELECT jumper (Fig. 10), and the W974B COOL SETUP SELECT jumper (Fig. 10) to the desired settings.