

- If air temperature rise is above the temperature rise range specified in Table 10, furnace is overfired or has insufficient airflow. Check gas input following the instructions in Section 17, "Checking Gas Input Rate." If air temperature rise is still above temperature rise range specified, more heating airflow is needed. Change blower heating speed to a higher setting following instructions in Section 21, "Adjusting Blower Speed."
- If air temperature rise is below the temperature rise range specified in Table 10, furnace is underfired or has too much airflow. Check gas input following the instructions in Section 17, "Checking Gas Input Rate." If air temperature rise is still below temperature rise range specified, less heating airflow is needed. Change blower heating speed to a lower setting following instructions in Section 21, "Adjusting Blower Speed."
- After making adjustments, you must check air temperature rise to verify that resulting air temperature rise is within allowable range. If air temperature rise is still outside the temperature rise range specified in Table 10, check duct system design with a qualified heating engineer. It may be necessary to re-size the ductwork. Recheck air temperature rise after revising duct systems.

SECTION 23. MEASURING AIR TEMPERATURE RISE

Air temperature rise (supply air temperature minus return air temperature) must be within allowable air temperature rise range specified on furnace rating plate and in Table 10.

You will need 2 thermometers with 1 degree resolution capable of reading up to 200 degrees F.

Follow this procedure:

1. Open supply air registers and return air grilles. Make sure the registers and grilles are free of obstruction from rugs, carpets, drapes or furniture.
2. Set balancing dampers in supply duct system.
3. Check ductwork for obstructions or leaks.
4. Make sure filters are clean and in place.
5. Make sure that blower speed taps are set for proper heating and cooling. Refer to Section 21, "Adjusting Blower Speed." Heating speed should be set according to Table 10. Cooling speed should be set to meet cooling equipment requirements. See Table 11 for cooling airflow capacities at 0.5 inch W.C.
6. Place one thermometer in supply air plenum approximately 2 feet from furnace. Locate thermometer tip in center of plenum to ensure proper temperature measurement.
7. Place second thermometer in return air duct approximately 2 feet from furnace. Locate thermometer tip in center of duct to ensure proper temperature measurement.
8. Set room thermostat on highest temperature setting. Operate furnace 6 minutes. Record supply air and return air temperatures.
9. Calculate air temperature rise by subtracting return air temperature from supply air temperature.

10. Set room thermostat to desired setting.

11. Remove thermometers and seal ductwork holes.

NOTE: Failure to seal holes could result in reduced system performance.

SECTION 24. CHECKING CONTROLS

Before leaving the work site, check to see that all controls are functioning properly.

You will need a 0 to 15 inch water manometer with 0.1 inch resolution and a 1/8" NPT manual shut-off valve.

Follow this procedure:

1. Turn off electricity at electrical disconnect switch next to furnace.
2. Turn gas control switch to "OFF" position.
3. Connect a manometer to gas control outlet (manifold) pressure tap.
4. Set room thermostat to its highest temperature.
5. Turn on electricity at electrical disconnect switch located next to furnace.
6. Diagnostic light labeled "OK" on Control should be on and flashing quickly.

7. Diagnostic light labeled "FLAME" on Control should be off.
8. Draft inducer should run and igniter should spark. Manifold pressure should remain at zero.
9. Turn off electricity at electrical disconnect switch located next to furnace. Turn gas control switch to "ON" position.
10. Turn on electricity at electrical disconnect switch located next to furnace. Draft inducer should run, igniter should spark and ignite main burners. It may take several minutes to purge the gas line before the main burners ignite. Wait 30 seconds after main burner ignition for main blower to start.
11. Cycle electrical disconnect switch next to furnace on and off. Watch at least three ignition cycles. Igniter should ignite main burners smoothly.
12. Burner flames should look the same with circulation blower on and off.
13. Turn gas control switch to "OFF" position.
14. Remove manometer from gas control and replace outlet pressure tap. Turn gas control switch to "ON" position.
15. Use a commercial soap solution made to detect leaks and check all gas piping connections. Bubbles indicate gas leakage. Seal all leaks before proceeding.
16. Set room thermostat to desired setting.

SECTION 25. SETTING BLOWER TIMINGS

Heating blower on-delay is fixed at 30 seconds from when the main valve opens. It is not adjustable.

Heating blower off-delay is adjustable to one of four times: 90, 120, 160 or 180 seconds. Heating blower off-delay is factory set at 120 seconds. If a different blower off-delay is desired:

1. Find two small switches located near the 24-volt terminal strip on Control.
2. Determine switch settings for desired heating blower off-delay. See Figure 32.
3. Set switches on Control using a small screwdriver.

NOTE: Cooling blower off-delay is fixed at 90 seconds and is not adjustable.

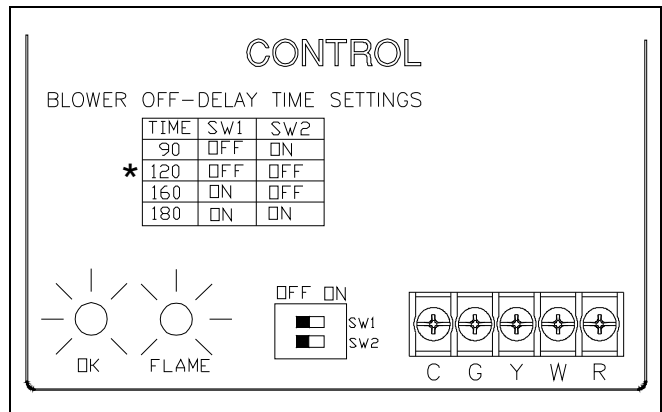


Figure 32. Heating Blower Off-Delay.

SECTION 26. MAINTAINING FURNACE IN GOOD WORKING ORDER



WARNING: Use replacement parts listed in parts list only. Use of incorrect parts on this furnace could cause improper furnace operation, resulting in damage, injury or death.

Inspection and cleaning by a qualified service person should be performed once before each heating season begins and once during heating season. Make sure the inspection includes each of the items listed below.

Before inspecting furnace:

1. Turn room thermostat to its lowest or off setting.
2. Turn off equipment shut-off valve.
3. Wait at least five minutes for furnace to cool if it was recently operating.
4. Turn off furnace electrical power.



WARNING: Failure to disconnect electrical power before servicing furnace could result in electrical shock or death.

Inspect the following:

- An operational check of the entire system. Assure that the furnace is operating properly and safely.
- Vent connector and vent pipe must be in place, slope upward at least 1/4 inch per foot and must be physically sound, without holes or excessive corrosion.
- All venting components including vent connector, vent pipe, chimney and vent cap must be clear and free of obstructions.

- Furnace-room or closet combustion and ventilation air openings must be clear and free.
 - Furnace combustion air openings must be clear and free.
 - Return air duct must be physically sound, sealed to the furnace casing and ending outside the space containing the furnace.
 - Supply air ducts and return air ducts must be clear and free, and without air leaks.
 - Registers and return grilles must be open and unobstructed by rug, carpet or furniture.
 - The furnace must be well supported without sagging, cracks, gaps, etc. around the base.
 - There must be no obvious signs of deterioration of the furnace. Inspection must include burners, heat exchanger, inducer pan and draft inducer.
 - Inspect all electrical wiring and connections, including electrical ground.
 - Gas pipes must be checked for leaks using a commercial soap solution made to detect leaks.
 - Main burners must be in good adjustment as shown in the User's Information Manual. Main burner flame must be clear blue and centered within the heat exchanger openings.
 - Flame holders, located inside each main burner, should be checked for lint and debris.
 - Check the furnace area for combustible materials, flammable liquid near the furnace, corrosive materials, insulation material within 12 inches of the furnace and signs of high water levels.
 - Inspect, clean, or repair as needed the following items: blower housing, blower motor, blower wheel, air filters, draft inducer and cooling coil.
6. Disconnect blower motor wires from Control. See Figure 30.
 7. Remove 2 screws holding blower door in place. Remove blower door.
 8. Pull blower motor wires through casing hem.
 9. Remove power-disconnect assembly located in the middle of the blower deck.
 10. Remove 2 screws holding blower assembly to blower deck.
 11. Slide blower assembly out.
 12. After cleaning blower assembly, re-assemble in reverse order making sure speed selections are in original positions.

NOTE: Blower motor and inducer motor do not require oiling.

SECTION 27. BLOWER ASSEMBLY REMOVAL

Follow these steps to remove blower assembly:

1. Turn off furnace electrical power.
2. On downflow furnaces, remove vent pipe inside furnace.
3. Disconnect room thermostat wires from 24-volt terminal strip on Control.
4. Locate the five blower motor wires that feed through the casing hem.
5. Label blower motor wires for proper replacement.