

EQUIPMENT AND APPLIANCES

GAS FURNACE

Furnaces used in Winnebago and Itasca motor homes are equipped with an automatic ignition circuit which lights the main burner when the thermostat calls for heat.

The gas furnace is designed to provide safe and efficient heat throughout the interior of your motor home through the use of the LP gas and 12-volt electrical systems. The LP fuel is converted to heat at the burner and heats the metal heat exchanger. The blower then distributes this heat by way of connected heat ducts.

A fan switch, incorporated in the furnace, turns on the blower automatically when the temperature of the heat exchanger reaches a pre-set point. It is normal at the end of an operational cycle for the blower to cycle on once or twice to extract all the heat possible from the exchanger.

SUBURBAN

Operation - Lighting Instruction

1. To light the furnace, turn the manual valve to the OFF position and wait 5 minutes with blower running. (Set thermostat above actual temperature to operate blower).
2. After 5 minutes, set the thermostat to the OFF position.
3. Open manual valve. (Correct operating characteristics depend on this valve being positioned fully open. Never attempt to operate with valve partially closed).
4. Set thermostat on desired temperature.
5. Allow 30 seconds for main burner to light.
6. If burner does not light, set thermostat on OFF and repeat steps 1 through 5.
7. After 3 attempts with no ignition, go to shut down and determine cause.

NOTE: Do not continue to cycle furnace through thermostat in an attempt to get ignition.

TO SHUT DOWN

1. Turn manual valve to the OFF position.
2. Set thermostat on OFF.

BURNER ADJUSTMENT

To adjust primary air to the main burner, the small metal cover found just below and to the right of the electrode must be removed. Behind the cover is a slotted screwhead. With a screwdriver, turn screwhead counterclockwise for less primary air and clockwise for more primary air. A symptom of too much primary air will be a howling or screeching noise when the burner is

on (reduce air to correct). A symptom of too little air will be sooting on the exterior vent and a distinct yellow and floating flame (increase air to correct). A hard blue flame is the sign of correct adjustment.

NOTE: If a sooting condition cannot be corrected by the air adjustment on the burner, discontinue use of furnace until problem can be corrected by a qualified service agency.

SEQUENCE OF NORMAL OPERATION

1. When the thermostat calls for heat, the blower motor is energized immediately.
2. As the blower motor reaches approximately 75% of the normal r.p.m. (within 3 to 5 seconds) the micro-switch, in response to the air flow, will engage, allowing current flow to the module board.
3. After a 12-18 second delay, current will pass through the board to the solenoid valve.
4. The current to the valve opens it and allows gas to the main burner. The spark at the electrode then ignites the main burner.
5. After main burner ignition (usually within 18-25 seconds), the flame detector will sense the presence of main burner flame and deenergize the lockout feature within the board. After the 12-18 second delay, if the main burner does not ignite or the flame detector does not deenergize the lockout feature within 7 seconds, the unit will go into lockout. At this time, it will be necessary to set the thermostat on OFF and repeat steps 1 through 6 of the lighting instructions.
6. After 3 attempts with no ignition, or main burner continues to go off within 30 seconds, go to shutdown and determine cause. (See Service Hints).
7. If within a period of approximately 2 minutes after the main burner is lit, the thermostat is turned back, both the blower motor and solenoid valve are deenergized. However, if the furnace continues to run longer than 2 minutes, which it normally should, a slight snap can be heard from within the casing. The snap is caused by the fan switch as it changes its position. After this occurs, if the thermostat is satisfied or turned back, the solenoid valve will close, the flame on the main burner will go out, but the blower will continue to run for a short period of time and will then shut off. The purpose of this is to remove most of the remaining gases of the heat exchanger. Be assured that this period

of blower override is a part of the unit's normal operation.

FAN SWITCH

The purpose of the fan switch is to control the sequence of the blower operation. The fan switch is a two pole switch. When the bimetal disc of the fan switch is heated to the operating temperature, the switch closes. This completes a circuit through the motor from a direct source. The blower will continue to run as long as the chamber is hot even though the thermostat is satisfied and the main burner is off. When the chamber cools, the fan switch changes back to its original position and shuts the blower off. If the blower and burner shut off simultaneously after thermostat is satisfied, then the fan switch failed to change over. This is a symptom of a faulty switch - replace it.

LIMIT SWITCH

The purpose of the limit control is to turn off the gas to the main burner if for any reason the furnace becomes hotter than that which is safe. Improper operation of the furnace due to the limit control does not always indicate a defective control. If the circulating air is blocked or only partially so, the limit control will function and cause the main burner to cycle. Cycling on the limit is not always undesirable - if it happens only occasionally. This is a good indication of safe operation and will most likely happen on a warm day. If cycling happens too often or for an extended period, the circulating air system should be thoroughly cleaned.

If for any reason the limit control is found to be defective, there is no recommended method of repairing it. Because of its importance for safety reasons, it should be replaced with a new one.

WARNING

Never shunt the limit control even for only temporary operation.

MICROSWITCH

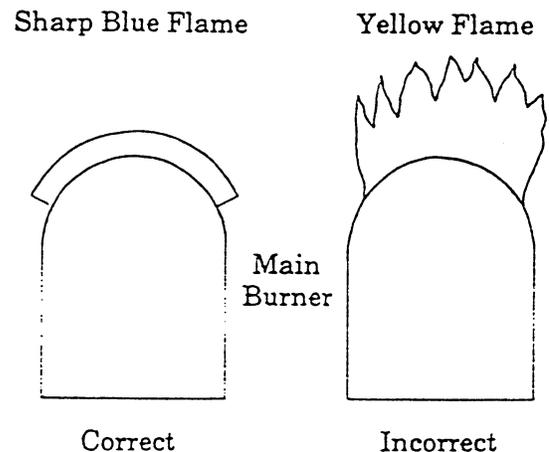
The microswitch has two purposes:

1. It is an air prover. It operates in response to the flow of air generated by the blower. Hence, if for any reason the air from the blower is not sufficient, the switch will not operate. This may be caused by a slow motor due to low voltage, restricted return air, inadequate duct discharge area, or lint accumulation on the blower wheel.
2. The switch allows time for the blower to pull in a sufficient amount of air to support

combustion before it engages. Once it engages, the circuit is completed through the limit switch and module board to the gas valve. The valve opens, gas flows to the burner, and ignition occurs.

BLOWER ASSEMBLY

Although one motor drives all wheels, the blowers are separate. The combustion-air blower is sealed so as to allow no passage of air between it and the circulating room-air blower. The combustion-air blower draws air from the outside atmosphere, discharges it into the combustion chamber, and forces the combustion products out the exhaust tube. The circulating room-air blower pulls return air in and forces it across the heat chamber, discharging into the area to be heated.



MAINTENANCE AND CLEANING

Your furnace should be inspected before use at least annually by a professional service person.

A careful inspection of all gaskets should be made and if any gaskets show signs of leakage or deterioration, they should be replaced.

It is imperative that the control compartment, burner and circulating air passageways of the furnace be kept clean. More frequent cleaning may be required due to excessive lint from carpeting, bedding material, etc.

Periodic examination of the venting system should be maintained. It is important that the flow of combustion air entering from the rear of the furnace not be obstructed.

Periodic visual checks of the burner in operation should be made. If the primary air should need adjustment, follow the procedure outlined under Burner Adjustment.

Cleaning of the chamber and main burner will be required if the furnace has been allowed to

operate with a high yellow flame. The yellow flame is due to incomplete combustion (lack of air) and will deposit a soot formation inside the chamber and on the main burner.

The furnace is equipped with an oiled, sealed motor and requires no oiling.

NOTE: To service the furnace, the combustion chamber assembly must be removed from the furnace cabinet. (See instructions for removing chamber).

IMPORTANT

The furnace must be inspected and adjusted annually by a professional service person to assure proper operation.

TO REMOVE CHAMBER

1. Shut off gas at gas bottle.
2. Disconnect power supply (quick disconnect plug, right side of cabinet).
3. Disconnect gas line from manual shutoff valve.
4. Remove shutoff valve from side of furnace.
5. Remove shipping screw securing chamber shield to cabinet (lower right corner).
6. Remove the vent cap screws (outside) to free exhaust tube.
7. Pull chamber forward and out of cabinet.
8. To reinstall - reverse above procedures.

NOTE: Combustion chamber removal of NT-24MD and NT-30MD same as NT-24M and NT-30M.

FURNACE TROUBLESHOOTING

Should difficulties occur with the furnace, contact your dealer for assistance. However, a great number of service calls are unnecessary and could be avoided by first checking these areas of the LP gas and electrical systems:

1. Make sure there is gas to the furnace. Turn all gas valves to "On" position.
2. Make sure system switch, located inside front panel, is at "On" position.
3. Make sure electrical fuse for furnace, located on control panel, is not blown. Replace if necessary.
4. When operating on battery power, make sure auxiliary battery is fully charged.
5. Check gas supply to make certain tank is not empty or that regulator is not frozen.
6. If pilot continuously goes out, make sure observation cap with gasket is secure.
7. Check pilot flame - if not easily seen and a blue color, have a serviceman adjust to proper size and color.

8. Make sure registers are fully open and not blocked, pinched or bent closed.

RANGE AND OVEN

The range and oven in your motor home are operated on LP gas and will provide nearly all of the functions that the range in your home does. One of the features of gas burners is that heat is available as soon as a burner is lit; as opposed to an element heating up. The range has a "Pilot Off" position on the oven control which allows the oven pilot to be turned off when traveling or refilling the LP tank.

WARNING

Do not use range or oven for comfort heating of the coach.

Use of Top Burners

1. Light match.
2. Turn control knob left (counterclockwise to the full "On" position).
3. Apply lighted match immediately to the burner.
4. Adjust the flame height by turning the knob toward the "Off" position.

WARNING

Do not turn burner control knob to "On" and allow gas to escape before lighting match.



BURNER CONTROL