

#### 4. SEQUENCE OF NORMAL OPERATION

- a. When the thermostat calls for heat, the blower motor is energized immediately.
- b. As the blower motor reaches approximately 75 percent of the normal r.p.m. (within 3 to 5 seconds) the microswitch, in response to the air flow, will engage allowing current flow to the solenoid valve and the spark ignition system.
- c. The current to the valve opens it and allows gas to the main burner. The spark then ignites the main burner.
- d. After main burner ignition, the flame detector will sense the presence of flame (usually within 7 seconds) and deenergize the lockout feature. If the main burner does not ignite or the flame detector does not deenergize the lockout features 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 thru 5 of the lighting instructions.
- e. If after 3 tries and no ignition or main burner continues to go off within 7 seconds, go to shut down and determine cause.
- f. 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 from the heat exchanger. Be assured that this period of blower override is a part of the unit's normal operation.

#### 5. 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 burner and blower shut off simultaneously after thermostat is satisfied, then the fan switch failed change over. This is a symptom of a faulty switch — replace it.

#### 6. LIMIT CONTROL

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 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 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.

CAUTION: Never shut the limit control even for temporary operation.

#### 7. MICRO SWITCH

The microswitch has two purposes.

- a. It is an "air prover." It operates in response to the current of air generated by the blower. Hence, if 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, or lint accumulation on the blower wheel.
- b. 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 solenoid valve opens, gas flows to burner, and ignition occurs.

#### 8. BLOWER ASSEMBLY

Page 9-2 shows a breakdown of the blower assembly. Although one motor drives all wheels, the blowers are separate. The combustion air blower is sealed so no air will pass 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

We recommend that the furnace be inspected and thoroughly cleaned by a qualified service agency before each heating season. This would include the combustion chamber, the main burner, the blower assembly, and all control parts. A careful inspection of all gaskets should be made and if any gaskets show signs of leakage or deterioration, they should be replaced.

Cleaning of the chamber and main burner will be required if the unit 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.

To clean the chamber, main burner, blower assembly and controls, the chamber assembly must be pulled from the furnace cabinet. (See instructions for removing chamber.)