

# **SCOTTY SS**

**WOOD FURNACE MODEL DB-202A**

## **OWNER'S MANUAL**

### **IMPORTANT**

READ OWNER'S MANUAL THOROUGHLY BEFORE INSTALLING FURNACE OR LIGHTING FIRE.

CONSULT LOCAL AUTHORITIES IF IN DOUBT ABOUT YOUR LOCAL FIRE SAFETY REGULATIONS.

ALL INSTALLATIONS MUST BE MADE IN ACCORDANCE WITH LOCAL AND STATE OR PROVINCIAL CODES WHICH MAY DIFFER FROM THIS MANUAL.

IMPROPER INSTALLATION WILL RESULT IN VOIDING OF WARRANTY.

ADD-ON TO CLASSIC AND CLASSIC AIR OIL-FIRED FURNACES ONLY.

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Appendix

## GRANBY SCOTTY SS Wood Furnace Model DB-202A

Certified by the Canadian Standards Association (CSA) Sept. 1982 and Sept. 1988

Manufactured by: GRANBY FURNACES INC  
PO BOX 637  
12118 HIGHWAY 209  
PARRSBORO NOVA SCOTIA CANADA  
B0M 1S0

[www.granbyindustries.com](http://www.granbyindustries.com)

## SPECIFICATIONS

Length	34"
Width	22 1/2"
Height	43"
Shipping Weight	238 lb
Fire Box 1/8"plate	Length
	27 1/2"
	Diameter
	18"
Secondary Heat Exchanger	14 gauge steel
Cast Iron Fire Box Door	12" x 12"
Warm Air Plenum	21" x 30 1/2"
Return Air Plenum	Not Applicable
Air Filter Size	Not Applicable
Blower Size	Not Applicable
Blower Motor	Not Applicable
CFM	1000 (Required)
Smoke Pipe	7" Inside Diameter
Floor to smoke pipe center	36"
Output (max)	70,000 Btu/h
Fuel	Wood up to 24" logs
Electrical Rating	Volts 120, Cycles 60, Amps 15

**NOTE** – Keep this manual in a safe place for future reference. Follow manual carefully for the correct way to install and operate this unit.

**CAUTION** – Do not fire this unit until operating instructions have been read and fully understood.

INSTALL WOOD FURNACE ONLY ON A FURNACE DUCT SYSTEM AND CHIMNEY THAT ARE IN GOOD CONDITION.

**SAVE THESE INSTRUCTIONS**

## **1.0 OPERATING INSTRUCTIONS**

### **1.1 INTRODUCTION**

Congratulations on your purchase of the Granby Scotty SS wood furnace. Developed in Atlantic Canada, this furnace has been designed to allow you to heat your home with wood, one of North America's most abundant fuels. Designed with you in mind, the furnace will provide you with many years of safe and efficient central heating.

To ensure you have a clear understanding of the operating procedures of this furnace, please take the time to read the remainder of this section on operating procedures.

### **1.2 WOOD-BURNING**

The furnace will burn most wood fuels; however it is recommended that only dry, seasoned hardwood be used as much as possible since it affords cleaner, safer and more efficient operation. Burning seasoned hardwood will leave less ash, soot and creosote residue and will require fueling less often. Use smaller loads of wood on warmer days.

**WARNING: DO NOT** use chemicals or fluids to start the fire or during operation. **DO NOT** burn driftwood or manufactured logs (compressed wood).

Before adding fuel to an existing fire turn up the thermostat for about five minutes or lift damper chain to hold damper fully open for about one minute before opening the loading door. This action will allow residual smoke to clear from the combustion chamber and reduce smoke entering the basement during refueling.

Twice daily refueling may be sufficient in modern well-insulated homes. However, we recommend that small fuel loads be added morning, noon, early evening and late evening, rather than large quantities infrequently. A small intense fire will burn more efficiently than a large smoldering fire in the furnace and will produce less creosote.

When refueling the furnace, the remaining coals should be raked to the front of the combustion chamber before adding any new fuel. Place the fresh supply of wood to the rear of the combustion chamber. This gives more of an even cigar type fuel burn, rather than a large hot fire to a slow amber fire. This will help create a more even and efficient burn. The furnace owner should attempt to gauge fuel quantities with outdoor temperatures; a little practice will provide greater satisfaction and efficiency.

**WARNING** - This furnace is not to be used with an automatic stoker.

Keep firebox door tightly closed and maintain door seal in good condition.

**CREOSOTE**

Wood combustion is never 100% complete. Wood smoke always contains some unburned gases and a mixture of unburned tar-like liquids. A percentage of these materials will condense out on any cool surface, leaving a dark brown or black substance with an unpleasant acrid odour. This substance is commonly called creosote.

If these wood gases condense out on cool surfaces such as a cold chimney or a long smoke pipe, they will retain large amounts of water and will be very fluid. At higher temperatures the condensed creosote will resemble tar (thick and tacky).

Creosote generation is highest during low heat outputs common with long smoldering burns. Creosote generation is lowest during high heat outputs common with intense fires. It is recommended that a small intense fire be used for best results against creosote build up even though the wood furnace will require refueling more often.

Creosote generation is also higher when burning green wood. The moisture in the green wood absorbs the heat from the fire, cooling the fire below the point at which the creosote can be consumed. The low temperature smoke is then further cooled in the upper furnace chambers' smoke pipe and chimney allowing large amounts of creosote to form.

To reduce creosote build-up during periods of low heat requirements (i.e. Spring and Fall) it is recommended to fuel the wood furnace with smaller quantities of smaller diameter logs. Matching fuel loads and heat requirements will result in cleaner combustion and higher efficiency.

**IN CASE A SERIOUS CREOSOTE FIRE BEGINS:**

- a) Call the FIRE DEPARTMENT at once!
- b) Close all draft regulators
- c) Throw 1/2 lb of coarse or table salt on the fire and close door immediately
- d) Close the damper door by disconnecting chain

Have a firmly established Emergency Procedure in place for the handling of a flue fire.

**1.3 STORAGE OF WOOD**

Once cut, green wood dries (or seasons) quickly at first and then at a slower rate. When the wood has been cut to the proper length and split, it should be piled outside during the summer months. Place two poles on the ground to serve as rails to keep the firewood off the moist ground. Stack the wood so that both ends of the logs are exposed to the air if space is available, since more drying occurs through the cut ends than through the sides. This is true even with wood that has been split. The woodpile should be under cover so that it will not absorb moisture from the rain and snow before it is used but still open on the sides and ends to the drying effect of the wind and sun. Store wood in neat well supported piles.

**1.4 MAXIMUM SOLID-FUEL CHARGE**

The maximum level for a solid-fuel charge is the middle of the loading door, or the level of the handle. **DO NOT OVERFILL.** The furnace will accept whole or split logs up to 27" (686 mm) long, but a 24" (610 mm) log length is recommended for convenience and ease in handling. Maximum damper gate opening is 9/16". Do not tamper or adjust to greater opening in an attempt to increase fire or over-firing and hazard may result.

## 1.5 MAINTENANCE

Some regular maintenance is necessary. A good practice is to establish a routine for the storage of fuel, care of the appliance and firing techniques.

### 1.5.1 CLEANING (Fig. S202-14)

The furnace must be cleaned regularly to maintain top efficiency. The furnace needs cleaning more often when burning green wood or during long periods of low fire. When the furnace is first installed the heat exchanger should be checked visually from the firebox and smoke pipe hole every week to determine the rate at which creosote or ash is accumulating within the furnace. Cleaning should be done whenever there is more than 1/4" of build-up on the heat exchanger or 3" of ash in the base. If the wood furnace is to be left unused for an extended period of time (more than one month) then the appliance should be cleaned of all ash and residual left from the burning of wood.

#### **CLEANING PROCEDURE:**

- 1) Make sure fire is completely out and the furnace has cooled.
- 2) Remove the smoke pipe located on the rear of the furnace heat exchanger.
- 3) The heat exchanger is now accessible for cleaning.
- 4) Use the scraper provided to remove all soot and ash from the furnace heat exchanger and exposed surfaces.
- 5) Scrape all residue ash in the top heat exchanger towards the front of the furnace where it will fall into the firebox.
- 6) Always check flue pipe for creosote or ash build-up in the pipe and clean if necessary.
- 7) Reinstall the smoke pipe making sure that all joints are secured with at least 3 sheet metal screws.
- 8) Check chimney cleanout for ash build-up and remove any accumulation.
- 9) Residue may be removed from the firebox or left to be burnt during the next fire. It is good practice to leave a layer of ash approximately one inch deep in the base of the firebox.

#### **DISPOSAL OF ASHES**

Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible floor or on the ground well away from all combustible materials pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed they should be retained in the closed container until all cinders have thoroughly cooled. **IMPORTANT** – No other waste shall be placed in this container.

**WARNING** – Ashes usually contain live dormant coals, which may burn for many hours after a recognizable flame has disappeared. Use extreme caution when handling and disposing ashes.

### 1.5.2 SERVICING

The furnace air filter must be checked monthly and replaced when necessary. Annually lubricate the blower motor, if it is not permanently lubricated, with 4-6 drops of SAE-30 oil in each bearing.

**CAUTION** - Failure to keep air filter clean will result in poor furnace performance and possible damage to wood furnace heat exchanger.

## 1.6 SAFETY

If the furnace overheats due to improper operation the following precautions should be taken:

- 1) **DO NOT** shut off power. Blower must be kept running to disperse excessive heat.
- 2) Manually close the damper door by unhooking the chain.
- 3) Check controls for proper operation before starting a new fire.

**WARNING** – The maximum opening of the combustion air damper is preset at the factory. **DO NOT** adjust the stop or attempt to increase the combustion air by any means.

## 1.7 CONTROLS

### Thermostat

The primary control is the room thermostat located near the center of the house on the main floor or near an existing thermostat. The thermostat operates the damper motor to open and close the damper door thus allowing more or less air into the firebox to control the fire.

### Fan and Limit

The fan and limit control mounted in the plenum controls the operation of the circulating blower and prevents the furnace from over-heating. When the air temperature in the plenum reaches the “ON” set point of the fan switch, usually 140°F (60°C), the blower starts and runs until the plenum cools to the “OFF” set point, usually 100°F (38°C), then the blower is switched off. The limit function in this control is usually set at 280°F (138°C) and will override the room thermostat to close the damper door if the furnace overheats and will also prevent the oil furnace from starting.

## 1.8 ELECTRICAL POWER FAILURE (Fig. S202-3A)

If no one is home during a power failure, the damper will automatically close and some gravity heating will take place. Combustion air will continue to enter through the secondary air holes and a fire should be maintained.

**IMPORTANT** – This furnace is CSA certified for operation under power failure only if optional Power Failure Kit is installed.

For optimum heating during a power failure follow the procedure listed below:

- 1) Remove the power failure gravity air inlet cover before starting or refueling during power failure. The kit must be installed on the cabinet side directly opposite to the entry of the blower or oil furnace “S” connection ductwork. See Fig. S202-3A.
- 2) Remove blower compartment access door on connected oil furnace to allow gravity flowing air to all areas (check with your installer).
- 3) Place a coin under the damper door in a way that it will fall clear when power is restored.
- 4) Maintain a careful watch on the furnace temperature. If it should exceed 200°F (95°C) close the damper door.
- 5) Do not leave the furnace unattended in this position.
- 6) Refuel frequently with small load to maintain a small fire at 1/2 normal maximum volume.
- 7) Do not expect to maintain maximum comfort under power failure conditions.
- 8) Do not allow anyone who is unfamiliar with the operation of the furnace to attend it during a power failure.



## 1.9 HOMEOWNER CHECKLIST

- a) Always observe the minimum clearances to combustible materials – Front 48" (1220 mm); one side 6" (152 mm); opposite side and rear 24" (610 mm); and flue pipe 18" (465 mm).
- b) Use only dry wood. **DO NOT** burn garbage, gasoline or naphtha.
- c) Load carefully. Never slam fuel against firebox walls, this could damage the firebox.
- d) Remove ashes as directed. Watch for soot build up in smoke pipe – clean regularly.
- e) Clean furnace heat exchanger regularly.
- f) Be aware of danger due to over-firing of the unit.
- g) Do not load above maximum load level (middle of loading door) or overheating may result.
- h) This unit is **NOT** suitable for automatic stoking.
- i) Do not store solid fuel within the space required for cleaning and ash removal.
- j) Establish a routine for storage of fuel, care of the appliance and firing techniques.

## 2.0 INSTALLATION INSTRUCTIONS

### 2.1 INTRODUCTION TO INSTALLERS

Before installing this furnace, please read the following instruction manual carefully. This unit is designed to be an add-on to a central heating furnace to provide complete central heating in medium sized well-insulated homes. Before installing be sure unit is properly sized for the intended application. Warranty does not cover misapplication of unit.

#### **Applicable Standards**

The furnace must be installed in accordance with the requirements of the National Fire Protection Association codes, the Canadian Heating, Ventilation and Air Conditioning Code, The National Board of Fire Underwriters and the CSA Standards for solid fuel burning equipment as outlined in B365-01. In all cases consult your local authorities and fire insurance company for specific regulations.

### 2.2 UNCRATING

When you receive your furnace, check it carefully to ensure that all components are present and in good condition. If there has been any damage or loss in transportation, please notify the carrier and retailer at once. Inspect for the following:

- 1) Firebox/Heat exchanger
- 2) Poker/Coals rake
- 3) Marking template (return air and power failure bypass inlet)

**CONTROL KIT A** (Oil add-on) or **E** (Electric add-on) which includes:

- 1) L4064R Fan and Limit Control
- 2) Control Mounting Plate
- 3) Damper Motor
- 4) Thermostat (T822D or equivalent)
- 5) Wiring Harness and Parts
- 6) Switching Relay R8405C (8A05A – 4)

**NOTE** - Some parts may be packed inside furnace firebox. Check shipment carefully before assuming shortage.

## 2.3 LOCATING THE FURNACE (Fig. S202-1, Fig. S202-3B)

The location of the furnace must be as close as possible to the tile-lined brick chimney or factory-built solid-fuel approved chimney (ULC S629). Keep in mind also the day-to-day operation and place for ease of fueling and cleaning. We recommend installation, if possible, in a central location in relation to the outlet registers and the use of large warm air ducts to improve heat distribution during a power failure.

It is important to provide adequate combustion air to the furnace. It may be necessary to add a ventilator to an exterior wall of a closed furnace room or an airtight basement.

The furnace must be installed so that the clearances as shown in Fig. S202-1 or those of local authorities are met. Also if the furnace must be installed on a combustible floor, a non-combustible base must be built as shown in Fig. S202-3B. Two layers of hollow masonry block (4" thick) are placed at right angles to each other so that the ventilation holes of one layer are opposite to those of the other layer. Also there must be a minimum of one layer of fireproof board and one layer of 26 gauge galvanized sheet metal beneath the masonry blocks. This base must extend beyond the furnace to a minimum distance of 18" (457 mm) in front and 8" (204 mm) on all other sides.

## 2.4 FLUE PIPE & CHIMNEY

The furnace must be located to meet a minimum venting distance between the furnace and the flue. It should also be ducted so that there are a minimum number of elbows used. The flue pipe must be installed with a gradual rise of 1/2" or more per foot from the furnace to the flue. NEVER ALLOW THE SMOKE PIPE TO RUN DOWNHILL TO THE FLUE!

The smoke pipe and chimney should be at least 7" in diameter. The flue pipe or chimney may be of different cross-sectional area than that of the appliance smoke pipe, provided that sufficient draft is available at the appliance. Space must be provided around the smoke pipe and the back of the furnace to allow access for cleaning. Smoke pipes must not be lighter than 24 gauge black steel. All pipes must be securely fastened with at least 3 sheet metal screws at every joint and properly supported. Always meet or exceed flue pipe clearance specifications - 18" clearance from flue pipe to combustibles in all directions.

Connect the furnace only to an approved chimney suitable for solid fuel appliances which has a flue size equal or greater than furnace smoke pipe outlet area. The chimney must be installed with proper clearances above roof and from adjacent structures and trees. If a masonry chimney is used it must be in good condition and be equipped with a tile liner. Flue thimble or flue pipe must not extend into the chimney flue, as it will reduce the draft.

Connect only to a flue or chimney capable of maintaining a negative draft of .05" w.c. at all times and conditions.

**WARNING** - If this setting is exceeded it could cause a solid fuel fire to burn out of control.

We recommend that the wood furnace be connected to its own chimney; however, two or more fuel-fired appliances other than fireplaces, wood stoves or incinerators may be connected to the same chimney.

The National Standard of Canada, Installation Code for Solid-Fuel-Burning Appliances and Equipment, CSA-B365-01 clause 5.2.9 states that two or more appliances shall not be connected to the same chimney flue unless:

- a) The appliances are located on the same story;
- b) A negative pressure is maintained at the flue collar of each appliance;
- c) Each appliance is provided with a means to control the rate of flow of air or flue gases through the appliance combustion and heat exchanger chambers. Where limitations on flue pressure (draft) are contained in the manufacturer's instructions, such means shall be capable of maintaining at the flue collar, the pressure specified by the appliance manufacture; **NOTE:** For the purpose of this Clause, draft controls include ash pit air control dampers, dampers or draft slides wherever located, over-fire and flue pipe key dampers, and check draft controls located on or in the flue pipe;
- d) The flue pipes of the appliances are connected to a manifold as close to the chimney as practicable or directly to the chimney in the following order:
  - i. If only solid fuel is used, the flue pipe from the smallest appliance shall be on top (downstream);
  - ii. If different fuels are used as permitted in Clause 5.2.7 CSA-B365-01, the oil flue pipe shall be on top (downstream); and the solid fuel flue pipe on the bottom (upstream); and
- e) The chimney flue is capable of venting the flue gas by natural draft when all appliances not interlocked to prevent simultaneous firing are firing at their maximum rate at the same time.

When installing a wood-burning appliance to an existing chimney carefully inspect entire chimney for the presence of old inlet holes which may be improperly covered by metal caps or other unacceptable means. Fill any openings with brick and mortar to ensure no hazardous openings exist.

## 2.5 CLEARANCES (Fig. S202-1)

The furnace is to be installed in accordance with National Building Code or local regulations. Allowances front and rear must be made for cleaning and servicing.

### Minimum safety clearances to combustibles are:

Front	48"	1220 mm
Side	6"	152 mm
Other Side (for rear access)	24"	610 mm
Rear*	24"	610 mm
Flue Pipe to combustible, other furnace & electrical wiring	18"	457 mm
Wood Furnace above Plenum and 6' (1.8 m) of duct	6"	152 mm
Supply Duct beyond 6'	2"	50 mm
Return Duct Plenum and 6' (1.8 m) of duct on solid fuel burning warm air furnaces	3"	76 mm

\* Regardless of minimum clearances to combustibles for safety reasons, a minimum clearance of 30" (765 mm) should be allowed at the furnace rear for cleaning due to length of cleaning rake and access to smoke pipe.

These clearances allow adequate combustion air to reach the furnace.

## **WARM AIR DUCT & PLENUM CLEARANCES**

The following clearances must be observed and must meet all local building, electrical and fire codes. Follow the National Standard of Canada, Installation Code for Solid Fuel Burning Appliances and Equipment, CSA-B365-01; the National Board of Fire Underwriters and in the US the NFPA codes.

The furnace warm air plenum and first 6' (1.8 m) of warm air supply duct in any direction must be installed observing a minimum of 6" (152 mm) clearance from the joists or combustible materials. Beyond the first 6' (1.8 m) of supply duct, a 2" (51 mm) minimum clearance must be maintained between the warm air supply ducts and all joists or combustible material. See Fig. S202-1.

Return air ducts, including main ducts and branch ducts, on solid fuel burning warm air furnaces shall be installed to provide at least 3" (76 mm) clearance to combustible construction for the first 6' (1.8 m) away from the furnace plenum. **This requirement is not intended to apply to return air ducts serving an oil-fired, gas-fired or electric furnace to which an add-on furnace is connected.**

It is recommended that a non-combustible rigid board be fastened on the underside of the floor joists in the area of the ceiling above the furnace, warm air ducts and smoke pipe.

## **2.6 ADD-ON TO ANOTHER FURNACE**

The wood furnace may be installed very satisfactorily in conjunction with another furnace as tested by CSA under standard B365. In this installation the wood furnace is connected downstream in series with a new or existing electric or oil furnace. The blower from the existing furnace provides the air circulation. The wood furnace may only be added in series downstream from an oil furnace having an input rating (on original nameplate) between 0.75 and 0.90 gph (US) or SI equivalent.

### **For oil furnaces having multi-speed blowers with continuous circulation capability.**

Add-on furnaces such as the Scotty SS can be installed with oil-fired warm air furnaces such as the Contour Classic Air that have continuous blower circulation capability. A relay must be used if the furnace is to maintain the continuous circulation feature. The wiring diagrams for this installation is Fig. S202-6 and Fig. S202-8.

### **Disconnect Low Speed Circulation Fan Switch if Optional Relay is not used.**

Fig. S202-7 and Fig S202-9.

### **Disconnecting the circulation fan low speed switch.**

If the red wire from the circulation fan switch, in the furnace wiring box, were disconnected from the yellow wire leading to the blower compartment and both red and yellow wires marretted off then there would be no need for the switching relay (Honeywell R4222D 1013 or equiv.).

In that case the two blue wires would marrette together at location "A" of Fig. S202-6 and Fig. S202-7 and provide power to the blower on high speed (black wire). The two blue wires being 1) Wood fan "ON" control and 2) Oil fan "ON" control.

Also 120 Volts can be fed back through any unused wire from the blower. All unused wires should be marretted off.

**Low Speed Switching Relay (optional) Fig. S202-6, Fig. S202-8**

The Honeywell (R4222D 1013 or equivalent.) relay is to prevent power from being fed to the blower motor on two motor windings at the same time.

- 1) The red wire from the circulation fan switch (Low Speed) on the oil furnace.
- 2) The blue heating wire from the wood fan limit control on high speed.

This relay will disconnect the circulation fan low speed switch and connect the high speed to the blower motor when there is a call for heat.

**Items required:**

- 1) Switching Relay R4222D 1013 (120 V Coil, 12 amp @ 120 Vac), or equivalent.
- 2) Junction box (4" x 4") and cover.
- 3) Square extension box (4"x 4"gyproc extension).
- 4) Two plastic universal bushings or junction box connectors.
- 5) White wire (12"), two insulated spade connectors.
- 6) Black wire (6"), two insulated spade connectors.
- 7) Brown wire (12"), two insulated spade connectors.
- 8) Yellow wire (12"), two insulated spade connectors.
- 9) Two cabinet mounting screws.

**Low Speed Switching Relay Installation Instructions:**

- 1) Turn off power to the oil furnace and wood furnace.
- 2) Mount the switching relay in a junction box in the blower compartment near the blower motor and motor wires. If possible mount relay on rubber or foam pad to reduce noise in ductwork.
- 3) Remove the white neutral wire from the blower motor and connect it to a selected neutral side of the relay coil.
- 4) Connect the white wire (item 5) to the second spade of the selected neutral side of the relay coil and the other end into the blower neutral wire location (where initial white wire was removed).
- 5) Remove the black high-speed wire from the blower motor (this should be the selected blower heating speed) and connect it to the power side of the relay coil (no relay spade #).
- 6) Connect the black wire (item 6) to the second spade of the selected power side of the relay coil and the other end of the wire on to one side of the normally open contacts (relay spade #1).
- 7) Connect the brown wire (item 7) to the high-speed connection on the blower motor and the other end of the wire on to the other side of the normally open contacts (relay spade #3).
- 8) Remove the yellow low-speed wire from the blower motor (this should be the selected low-speed in the furnace wiring box) and connect it to one side of the normally closed contacts (relay spade #4).
- 9) Connect the yellow wire (item 8) to the low-speed connection on the blower motor and the other end of the wire to the other side of the normally closed contacts (relay spade #5).
- 10) Turn on power to the oil furnace and wood furnace. Check relay operation.

## 2.7 DUCT CONNECTION (Fig. S202-1, Fig. S202-2)

See Fig. S202-15 for **Approved Furnace Ductwork Configurations**.

See Fig. S202-16 for **Prohibited Furnace Ductwork Configurations**.

*The use of A/C coils is not recommended unless special arrangements are made.*

Minimum cross-sectional area of ductwork from furnace should be approximately 160 square inches with equal or larger size for return air.

The furnace must not be installed as a gravity system as the controls are not designed for this type of operation.

The dimensions and locations of permissible openings in casings for ducts, blower or emergency air are clearly identified on the furnace or on specific templates enclosed in the firebox.

Make or enlarge the openings in the wood furnace casing exactly as identified for add-on connection and on the appropriate side, trim the furnace insulation flush with cut opening. Fasten edges of insulation securely with metal straps or bend tabs of duct starting collar over insulation edge to hold it in place.

**DO NOT** use duct elbows having an inside radius of less than 6" (152 mm). Use only 16" x 20" duct "S" type interconnection for this furnace. Make all duct connections for the "S" type interconnection. See Fig. S202-2.

### **CAUTION:**

- a) This furnace is certified for installations using a divider in the plenum of the oil furnace.
- b) An Add-On unit must only be connected to a furnace, duct system and chimney which are in good operating condition.
- c) **DO NOT** relocate any of the safety controls in the original furnace installation.
- d) Operate the oil-fired unit periodically to ensure that it will operate satisfactorily when needed.
- e) **DO NOT** connect to duct work so that a reverse flow is possible.
- f) Before attempting installation, determine if there is suitable space available in the furnace area for the furnace connection outlined herein.
- g) The external static pressure in the warm air duct to the house of the original system must be measured prior to any changes to the system. These are to be reset to the same values after the add-on procedure to maintain airflow through the oil furnace.

An important requirement of this type of installation is that when installed in an existing system the main ducts may have to be lowered to assure proper and safe clearances from combustible material. See Fig. S202-1 and Fig. S202-2.

After all connections are made a static pressure test and/or temperature measurement must be made in the outlet plenum of the wood furnace. This is a simple procedure and is outlined as follows using a Dwyer Model 25 or equal inclined manometer.

- a) Drill hole in wood outlet plenum.
- b) Level inclined manometer and adjust to zero, insert manometer tube (Pressure end).
- c) With all duct work and doors in place static pressure should measure 0.2 in (50 Pa) with blower running.

Pressure may be corrected by the following measures:

- a) Change blower pulley size (usually decrease).
- b) Change blower motor pulley (usually increase).
- c) Increase return air duct area (if restricted).

**CAUTION** – Current draw by blower motor should be checked after making any pulley change. If motor now draws greater current than that shown on the nameplate, a larger more powerful motor must be installed.

**IMPORTANT** – **DO NOT** change the blower.

As an alternative to the static pressure test method, the installer may make adjustments on the basis of temperature measurement. For this test the wood furnace must be at full operating temperature.

Take one temperature measurement in the front of the oil furnace plenum 12" to 16" up or approximately center. Take a second measurement in the wood furnace plenum (same position). Subtract one measurement from the other to arrive at a temperature difference (TD). The TD must be between 40°F and 100°F during normal operation and ideally around 80°F. The same adjustment procedure for pulleys applies for correction when using this method.

**CAUTION** – Most thermometers have a large time lag in reaching accurate measuring levels. It is important that this interval be measured for your thermometer by immersing it in boiling water and observing the time required for it to reach correct reading.

**IMPORTANT** – This equipment shall be installed in accordance with the instructions of the manufacturer and in a manner acceptable to the regulatory authority by qualified technicians experienced in such services. When required by the regulatory authority, such qualified technicians shall be licensed to perform this service.

The installation shall comply with the applicable requirements of CSA standard B365, Installation Code for Solid Fuel Burning Appliances and Equipment and if changes are made to the oil furnace this shall comply with CSA standard B139, Installation Code for Oil Burning Equipment.

## **2.8 CONTROL SYSTEM**

The fan and limit control and the damper motor should be located as shown in Fig. S202-2.

### **T822 – Room Thermostat – Wood Furnace**

The primary control is the room thermostat located near the center of the house in the main floor or near an existing thermostat. The thermostat operates the damper motor to open and close the damper door thus allowing more or less air into the combustion area to control the fire.

### **M847 – Damper Motor**

The damper door lever should be attached to the damper motor wheel with the chain included. Be sure the damper door is fully closed and the damper motor is not powered. Connect the chain to the damper door level and to the bottom hole in the damper motor wheel. As a final adjustment bend the top chain link slightly to vary the damper position.

**L4064R – Wood Furnace/Limit Control**

The fan and limit control mounted in the plenum controls the operation of the circulating blower and limits the air temperature to prevent the furnace from overheating.

**Set Points**

- 1) "ON" is usually set to 140°F (60°C). It turns on the circulating blower when the air temperature in the plenum reaches this temperature.
- 2) "OFF" is usually set to 100°F (38°C). It turns off the circulating blower when the circulating air temperature in the plenum drops to this temperature.
- 3) "Hi limit" is preset to 280°F (138°C). This will over ride the room thermostat to close the damper door if the wood furnace overheats.

**ALL ELECTRICAL WIRING MUST CONFIRM TO NATIONAL AND LOCAL CODES.**

**2.8.1 STATIC PRESSURE DROP TEST (Fig. S202-4)**

After all connections are made and the Add-On installation is complete check the static pressure in the outlet plenum of the wood furnace. This is done with an inclined manometer, similar to the Dwyer Model 25, capable of reading 0.2" to 0.50" w.c.

**Procedure:**

- 1) Drill hole in wood outlet plenum as indicated in Fig. S202-4.
- 2) Level the inclined manometer and adjust to zero.
- 3) Insert the pressure tube in the hole in the wood outlet plenum.
- 4) With all duct work and blower doors in place the static pressure at point "P" in the wood outlet plenum should measure 0.2" w.c. (50 Pa) with the blower running.

If the pressure is less than 0.2" w.c. (50 Pa) or that recommended by the electric furnace manufacturer, it may be corrected by the following means:

- 1) Change blower pulley size (usually decrease).
- 2) Change blower motor pulley (usually increase).
- 3) Increase return air duct (if restricted). If pressure is less than 0.2" w.c. (50 Pa) It may be corrected by increasing the flow area in the return air duct.
- 4) If it is a direct drive blower in an oil furnace, you may increase the blower speed.

Pressure correction – electric furnace with direct drive blower:

If pressure is less than 0.2" w.c. (50 Pa) it may be corrected by increasing the flow area in the return air duct.

Nortron 21B15H – Series B and similar.

**CAUTION** – Do not change the wiring of the direct drive blower motor.

**IMPORTANT** – DO NOT CHANGE BLOWER.

**CAUTION** – Check the blower motor current draw after making any pulley change. If the blower motor now draws a larger current than that shown on the nameplate a larger more powerful motor must be installed.



## **2.8.2 TEMPERATURE RISE TEST**

As an alternative to the static pressure test the installer may make adjustments on the basis of temperature measurements. For this test the wood furnace must be at full operating temperature.

Procedure:

- 1) Take one air temperature T1 through a small hole in the front of the electric outlet duct. Make sure you leave the thermometer in the air stream long enough for the reading to stabilize.
- 2) Take a second air temperature T2 through a small hole in the front of the wood furnace outlet plenum.
- 3) The temperature difference T2 – T1 is the air temperature rise and must be within the range 40-100°F during normal operation. Ideally it should be 80°F.
- 4) Use the same adjustments as in 2.8.1 above to correct a temperature rise above 100°F or below 40°F.

**CAUTION** – Most thermometers take several minutes to reach their true reading. With the thermometer in the same position in the hot air stream take two successive readings 10 minutes apart – if they are the same the temperature reading may be taken as stabilized. To check your thermometer accuracy immerse it in boiling water, it should read 212°F.

## **2.9 ADDITIONAL NOTES**

- **DO NOT** relocate any of the safety controls in the original oil furnace installation.
- **DO NOT** relocate any of the safety controls in the electric furnace installation.
- Operate the oil-fired unit or electric furnace periodically to ensure that it will operate satisfactory when needed.
- **DO NOT** connect ductwork so that reverse flow is possible.
- Before installation, determine if there is space available in the furnace area for the proposed Add-On.
- The external static pressure in the warm air duct to the house in the original system must be measured prior to any changes in the system. The static pressure is to be reset to the same value after the Add-On is installed to maintain the airflow through the oil/electric furnace.
- An Add-On unit must only be connected to an oil furnace, duct system and chimney which are in good operating condition.
- **DO NOT** interconnect an Add-On with duct elbow less than 6" (152 mm) inside radius.
- Always maintain combustion air to furnaces.

## **2.10 INSTALLERS FINAL CHECKLIST**

### **DUCTWORK INSPECTION**

- 1) Furnace ducted properly?
- 2) Proper duct clearances maintained?

### **FURNACE INSPECTION**

- 1) **DO NOT** use firebrick in the furnace.
- 2) Check settings on fan limit controls.

**WIRING INSPECTION**

- 1) Is main disconnecting switch within view?
- 2) Wiring cables protected from heat and not touching hot surfaces?

**FLUE AND SMOKE PIPE INSPECTION**

- 1) Flue inner size equivalent to 7" round or larger?
- 2) Separate entry and lower to flue for both solid-fuel and oil or gas smoke pipes?
- 3) Smoke pipe 24 gauge or better?
- 4) Smoke pipe secured by screws?
- 5) Draft regulator (if used) set at .05" w.c. maximum?
- 6) Clearances of smoke pipe 18" or better from combustible material?  
Metal protection is recommended.

**DEALER TO INSTRUCT HOMEOWNER**

- 1) Keep area around unit clean.
- 2) Use DRY wood only. Hardwood is preferred.
- 3) Load carefully.
- 4) Load level no higher than center of door.
- 5) Remove ash regularly as directed.
- 6) Look for soot build up in smoke pipe.
- 7) Danger of flue fire if poor fuel or poor maintenance produces creosote buildup.
- 8) Operation of unit during power failure (i.e. manual operation).
- 9) When shutting down for extended periods, clean unit thoroughly.

**3.0 ADD-ON TO OIL FURNACE (Fig. S202-1)**

The wood furnace may be connected downstream of a new or existing oil furnace. The blower from the existing oil furnace provides the air circulation. The wood furnace may only be connected downstream from an oil furnace having an input rating (on original name plate) between 0.75 and 0.90 USGPH or at least 1000 cfm.

For details and required duct clearances see Fig. S202-1. The minimum cross-sectional area of supply ductwork from the wood furnace should be 100 square inches. The return air duct area should be equal or larger.

As the controls are not suitable, the wood furnace must **NOT** be installed for normal operation as a gravity system.

**IMPORTANT** – This equipment should be installed in accordance with the manufacturer's instructions in a manner acceptable to the regulatory authorities and by technicians experienced in such work. When required by the regulatory authority, such technicians should be licensed to perform this service.

The installation shall comply with CSA standard B365, Installation Code for Solid Fuel Burning Appliances and Equipment. Changes made to the oil furnace installation shall comply with CSA standard B139, Installation Code for Oil Burning Equipment.

### **3.1 COMBUSTION AIR FOR WOOD & OIL BURNING APPLIANCES**

It is important to provide adequate combustion air to the furnace. It may be necessary to add a ventilator to an exterior wall of a closed furnace room or an airtight basement.

Air inlets of at least 100 square inches free area (1.5 in<sup>2</sup>/1000 Btu) must be provided to the room occupied by the wood-fired or oil-fired furnace. These fresh air inlets must provide or allow free access of fresh outside air to the furnaces. At no time or under any circumstances should a wood or oil-burning appliance be starved of combustion air.

The appliance must at all times be able to maintain the approved stack draft. The barometric draft regulator must be installed on the furnace smoke pipe in the same room or at least in such a way that there is unrestricted free passage of air between the combustion air inlet to the furnace or burner and the barometric draft regulator.

Operating a wood or oil-fired appliance with inadequate combustion air could be hazardous.

### **3.2 DUCT CONNECTIONS** (Fig. S202-2, Fig. S202-4)

See template packed in firebox for the dimensions and locations of permissible openings in the wood furnace casings for ducts, blower or emergency air.

Make or enlarge the opening in the wood furnace casing exactly as identified for Add-On connection and on the appropriate side, trim the wood furnace insulation flush with cut opening. Fasten edges of insulation securely with metal straps or bend tabs of duct starting collar over insulation to hold it in place.

See Fig. S202-2 and Fig. S202-4 to make all duct connections for the S-type duct interconnection.

**IMPORTANT** – If necessary move main ducts to meet safe clearance requirements of Add-On wood furnace. See Fig. S202-1.

#### **3.2.1 S-TYPE DUCT CONNECTION** (Fig. S202-2)

Use only 10" x 20" S-type duct interconnection. Duct elbows must be increasing from 10" x 20" to 12" x 20" clinch collar type. **DO NOT** use duct elbows having an inside radius less than 6".

#### **3.2.2 DIVIDED PLENUM** (Fig. S202-4)

The wood furnace is also certified for installation using a divider in the plenum of the oil furnace.

**CAUTION** - When a plenum divider (split plenum) is used in the oil furnace warm air plenum, all fan limit controls in the oil furnace plenum must be located 5" (127 mm) **BELOW** the divider. Limit controls for either the wood furnace or the oil furnace shall not be within 5" (127 mm) of any inlet or outlet duct or plenum divider when the controls are mounted as specified.

### 3.3 CONTROL SYSTEM

#### 3.3.1 ADD-ON TO OIL CONTROL KIT “A” (Fig. S202-2)

Control Kit “A” is required for Add-On to Oil installation of the wood furnace.

Add-On to Oil Wiring – Fig. S202-6, Fig. S202-7, Fig. S202-8 and Fig. S202-9.  
Layout Diagram – Fig. S202-2.

Kit “A” consists of the following:

- a) L4064R1027 11” Primary Fan Limit Control (Wood Furnace) with mounting stand-off. Fan “ON” – 140°F, Hi Limit – 280°F – see description below.
- b) One stand-off bracket for fan limit.
- c) M847A1031 Draft Damper Motor complete with chain and “S” hook. See description below.
- d) T822D1826 thermostat. See description below.
- e) Switching Relay (White Rodgers 8A05A-4) or equivalent. Prevents wood furnace and oil furnace from firing at the same time. Damper control mounting plate c/w decal.
- f) One 48” wood-to-oil wiring harness.
- g) One stand-off cable bracket (175 mm x 30 mm).
- h) 8 - 1/2” x #8 sheet metal screws.
- i) Wiring harness c/w 4” x 4” box, one flex conduit, wire nuts, antishorts and squeeze connectors.
- j) 3 - 1-1/2” x #10 sheet metal screws for fastening fan control to mounting bracket.

**IMPORTANT** – Both wood and oil furnaces must be supplied by the same single electrical branch circuit. A ground wire is necessary between the wood and oil furnaces.

The L4064R fan and limit control is mounted in the plenum over the wood fired furnace. It controls the operation of the oil furnace blower and shuts down the fire damper if the circulating air temperature rises above a fixed upper limit. See Fig. S202-2 for location.

#### **Adjustable Set Points**

- 1) “ON” is usually set to 140°F (60°C). It turns on the circulating blower when the circulating air temperature reaches this temperature.
- 2) “OFF” is usually set to 100°F (38°C). It turns off the circulating blower when the circulating air temperature drops to this temperature.
- 3) “Hi limit” is preset to 280°F (138°C). Overrides wood and oil thermostats, closes damper door and prevents oil furnace from starting.

#### **M847 Damper Motor, See Fig. S202-2**

The damper motor should be located as shown in Fig. S202-2. The damper door lever should be attached to the damper motor wheel with the included chain. Be sure that the damper door is fully closed when the damper motor is “off” or not powered. Connect the chain to the damper door lever and to the bottom hole in the damper motor wheel. As a final adjustment bend the top chain link slightly to vary the damper position.

#### **T822 Wood Furnace Thermostat – Fig. S202-5 to Fig. S202-9 & Fig. S202-14**

This is located at or near the center of the house on the main floor or near an existing thermostat. The thermostat operates the damper motor control to open and close the damper door thus allowing more or less air into the wood furnace combustion area to control the fire.

ALL ELECTRICAL WIRING MUST CONFORM TO NATIONAL AND LOCAL CODES.

## **4.0 ADD-ON TO ELECTRIC FURNACE**

### **4.1.1 NORTRON 21B15H – Series B Electric Furnaces (Fig. S202-14)**

The wood furnace is specifically approved as an Add-On to the Nortron 21B15H Series B electric furnaces. This manual shows the approved method of installation and the required elbow duct for furnace interconnection.

The Nortron FK120 – 120 VOLT KIT is not used to provide power to the wood furnace. This kit provides 120-volt power **ONLY** when the electric furnace blower motor is operating.

We recommend the Nortron 21B15H Series B furnace be mounted in the down flow or counterflow position using the installation shown in Fig. S202-13.

Use the clinch collar type duct elbow 17" x 17" (432 x 432 mm) increasing to 12" x 20" (305 x 508 mm) with an inside radius greater than 6" (152 mm).

**DO NOT** use duct elbows with inside radius less than 6" (152 mm).

### **4.1.2 OTHER APPROVED ELECTRIC FURNACES (Fig. S202-13)**

The wood furnace is also approved for other electric furnace 10 – 25 kW output as long as:

- 1) The electric furnace is approved to CSA C22.2 No. 23, Electric Central Warm Air Furnaces.
- 2) The electric furnace's internal air blower is at least that used in the 20kW version of the furnace. With other electric furnaces, approved to CSA C22.2 No. 23 use vertical duct elbows with the following specifications. See Fig. S202-13.
- 3) Outlet to wood furnace – 12" x 20" (305 mm x 508 mm) – to suit template opening in wood furnace wall.
- 4) Duct inlet to suit outlet of approved electric furnace.
- 5) Minimum inside radius of vertical duct elbow – 6" (152 mm).

**IMPORTANT** – approved configuration for add-on to electric furnaces shown in Fig. S202-17.

## **4.2 DUCT CONNECTIONS TO ELECTRIC FURNACE (Fig. S202-15)**

The wood furnace may be connected downstream of a new or existing electric furnace. The blower from the existing furnace provides the air circulation. The wood furnace may only be connected downstream from an electric furnace having a rating (on original name plate) of between 10 and 25 kW.

For details and required duct clearances see Fig. S202-12. The minimum cross-sectional area of ductwork from the wood furnace should be 100 square inches and equal or larger area for the return air.

As the controls are not suitable, the wood furnace must **NOT** be installed for normal operation as a GRAVITY system.

**THIS EQUIPMENT MAY ONLY BE INSTALLED AND TESTED BY QUALIFIED PERSONNEL**

Installation shall comply with – CSA standard B365, Installation Code for Solid Fuel Burning Appliances and Equipment, Changes made to electric furnaces shall comply with – CSA standard C22.2 No. 23, Electric Central Warm Air Furnaces.

#### **4.2.1 DUCT CONNECTIONS** (Fig. S202-17, Fig. S202-18)

The dimensions and locations of permissible openings in casings for ducts, blower and emergency air are clearly identified on the furnace or on templates enclosed in the firebox.

Make or enlarge the opening in the wood furnace casing exactly as identified for Add-On connection and on the appropriate side, trim the wood furnace insulation flush with cut opening. Fasten edges of insulation securely with metal straps or bend tabs of duct starting collar over insulation to hold it in place. Make all duct connections for the “L” type interconnection.

**IMPORTANT** – main supply and return ducts must meet minimum clearance to combustibles requirements for Add-On wood furnace. See Fig. S202-1 and Fig. S202-12.

#### **4.2.2 MINIMUM DUCT SIZES**

Main Supply: 8” x 16” minimum                      Main Return: 8” x 20” minimum

#### **4.2.3 L-TYPE DUCT CONNECTION AND FRAME** (Fig. S202-12)

Cut the side opening in wood furnace size 12” x 20” (305 x 508 mm) according to template provided.

#### **4.3 INSTALLATION SUMMARY** (Fig. S202-12, Fig. S202-13)

- 1) Install wood furnace and electric furnace as shown in Fig. S202-12 and Fig. S202-13.
- 2) Wire as shown in Fig. S202-14.
- 3) Check pressure drop across wood furnace as 0.2”wc (50Pa) as described in Section 2.8.1.

#### **4.4 CONTROL SYSTEM** (Fig. S202-13, Fig. S202-14)

Electrical Schematic for Add-On to Nortron FRK type electric furnace control system – see Fig. S202-14.

Electrical Schematic for Add-On to other electric furnace control systems – see Fig. S202-14.

**CAUTION:** DISCONNECT ELECTRICAL POWER FROM BOTH ELECTRIC FURNACE AND ADD-ON FURNACE BEFORE SERVICING.

## 4.5 ADD-ON TO ELECTRIC CONTROL KIT “E” (Fig. S202-13)

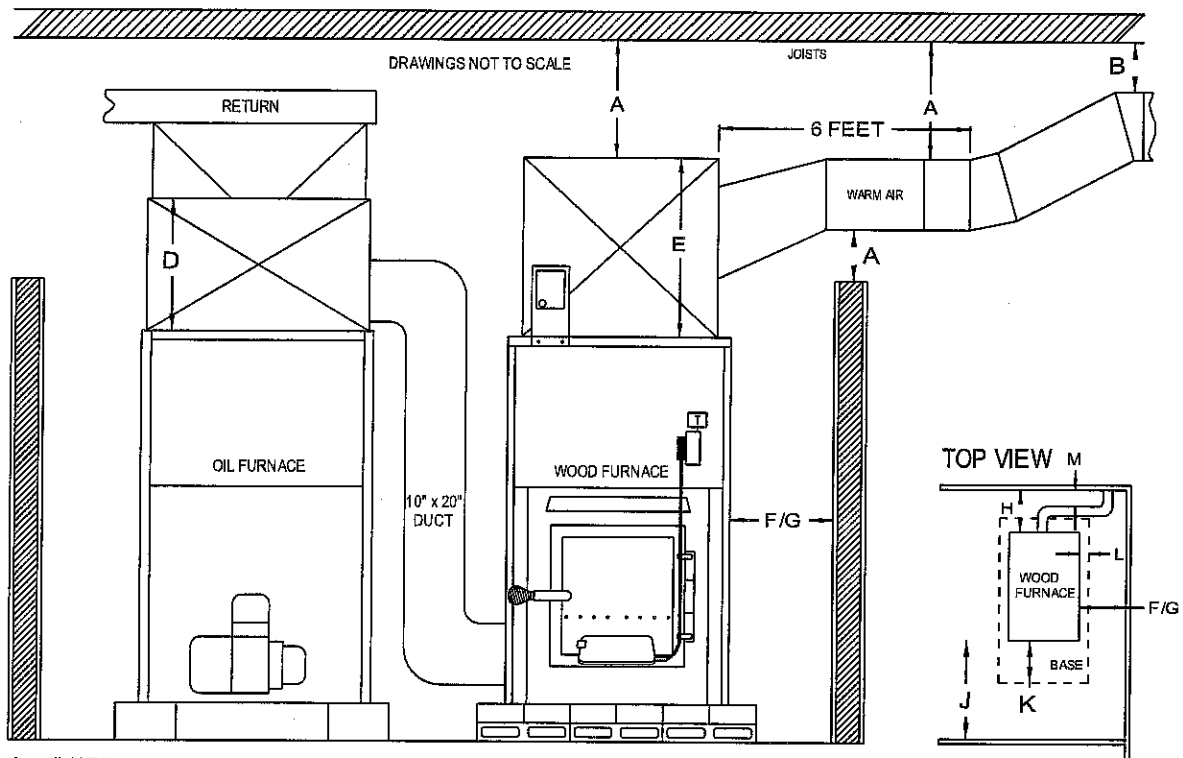
Control Kit “E” is required for Add-On to Electric installation of the wood furnace.

Kit “E” consists of the following:

- 1) L4064R1027 11” Primary Fan Limit Control (Wood Furnace) complete with stand-off bracket. Fan “ON” – 140°F, Hi Limit – 280°F. REMOVE JUMPER - see “Note” below.
- 2) M847A1031 Draft Damper Motor complete with chain and “S” hook. Lifts damper in response to wood thermostat’s call for heat. Be sure that damper gate is fully closed when damper motor is not powered. Connect chain to first or second hole up in wheel. Leave bottom chain link open for emergency disconnect – see description below.
- 3) T822D1826 thermostat. In Add-On installations, mount adjacent to electric furnace thermostat and label “wood”. **Note:** anticipator setting 0.32 amps. See description below.
- 4) White-Rodgers 8A05A-4 Switching Relay. Prevents wood furnace and electric furnace from firing at the same time.
- 5) Damper Control stand-off mounting plate c/w decal.
- 6) Cable stand-off brackets and cable clips.
- 7) 12 – 1/2” x #8 sheet metal screws.
- 8) Wiring Harness c/w 4” x 4” box, 2 flex conduit, wire nuts, anti-shorts and squeeze connectors
- 9) 3 – 1 1/2” x #10 sheet metal screws for fastening fan control to mounting bracket.

**IMPORTANT** – carefully follow the electrical schematic decal on wood furnace cabinet or Fig. S202-14. The electric power for the wood furnace must be supplied from the fused single branch circuit inside the electric furnace cabinet. A ground wire is necessary between the wood and oil furnaces.

**NOTE** – Remove Fan Limit Control jumper connection indicated in Fig. S202-14 & Fig. S202-15.



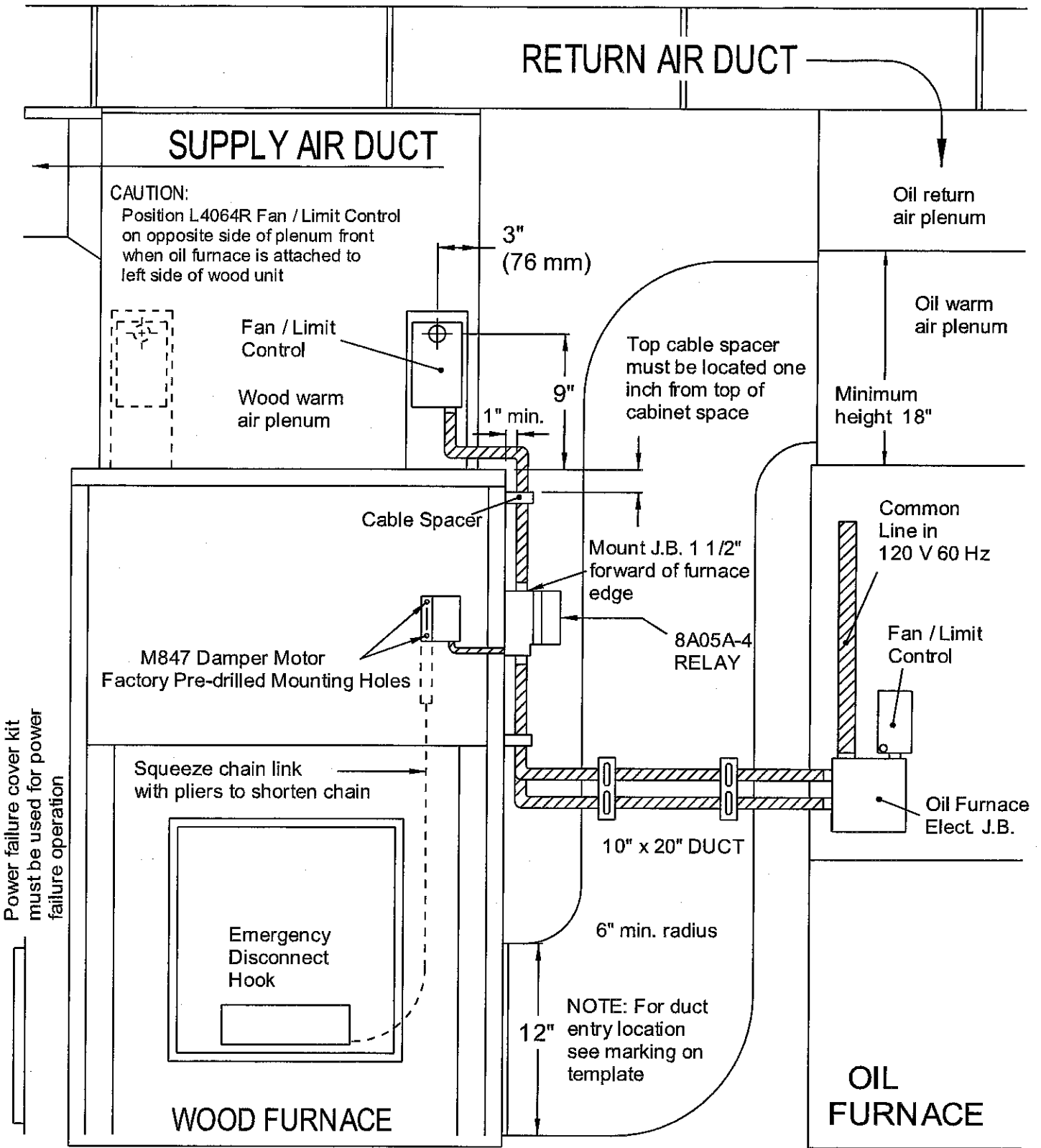
- A - 6" (152 mm) supply plenum and all supply ducts within 6' (1.8 m) of supply plenum.
- B - 2" (51 mm) all sides of warm air supply 6' (1.8 m) remote from plenum.
- C - 3" (76 mm) all sides of wood furnace return air plenum and return air duct within 6' (1.8 m) of plenum.
- D - 18" (457 mm) minimum warm air supply plenum height of the oil furnace.
- E - 18" (457 mm) Minimum warm air supply plenum height of the wood furnace.
- F - 6" (152 mm) one side of furnace.
- G - 24" (610 mm) other side of furnace for access to rear.
- H - 24" (610 mm) rear clearance to combustibles. A rear clearance of 30" should be maintained for cleaning.
- J - 48" (1220 mm) front clearance.
- K - 18" (457 mm) door side floor protecting pad (if not on concrete floor or concrete pad on ground).
- L - 8" (204 mm) floor protecting pad (if not on concrete floor or concrete pad on ground).
- M - 18" (457 mm) Flue pipe to combustibles and electrical services.

## CLEARANCES - ADD-ON TO OIL FURNACE

FIG. S202-1

202M0001.JAN11

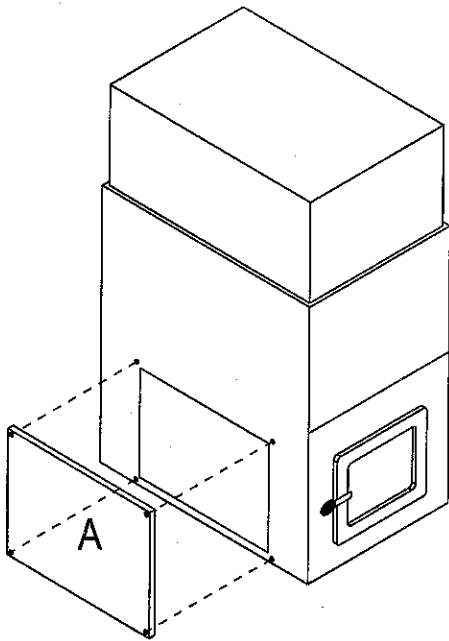




# SCOTTY SS WOOD OIL ADD-ON "S" TYPE DUCT

FIG.S202-2

202M0002JAN11

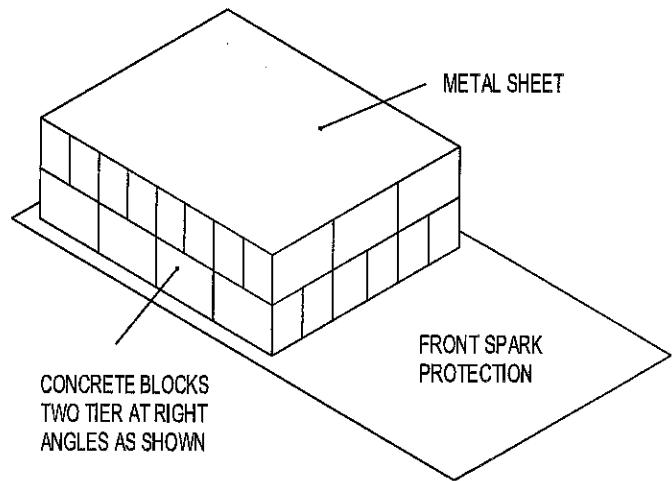


POWER FAILURE KIT (D00-KA-0500-00)  
 MUST BE INSTALLED ON FURNACE CABINET OPPOSITE  
 TO "S" DUCT CONNECTION.

LOCATE AND CUT HOLE IN CABINET USING TEMPLATE  
 PROVIDED.

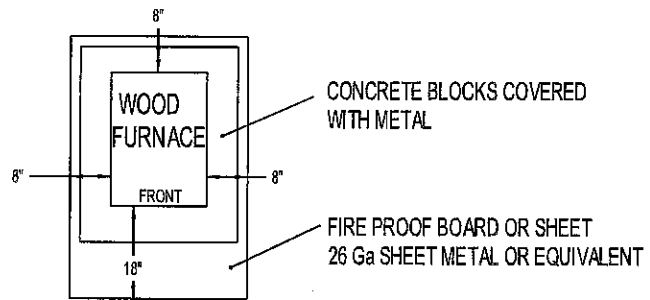
REMOVE INSULATED COVER "A" ABOVE BEFORE ANY  
 GRAVITY OPERATION (Power Failure)

**POWER FAILURE KIT**  
**FIG. S202-3A**



CONCRETE BLOCKS  
 TWO TIER AT RIGHT  
 ANGLES AS SHOWN

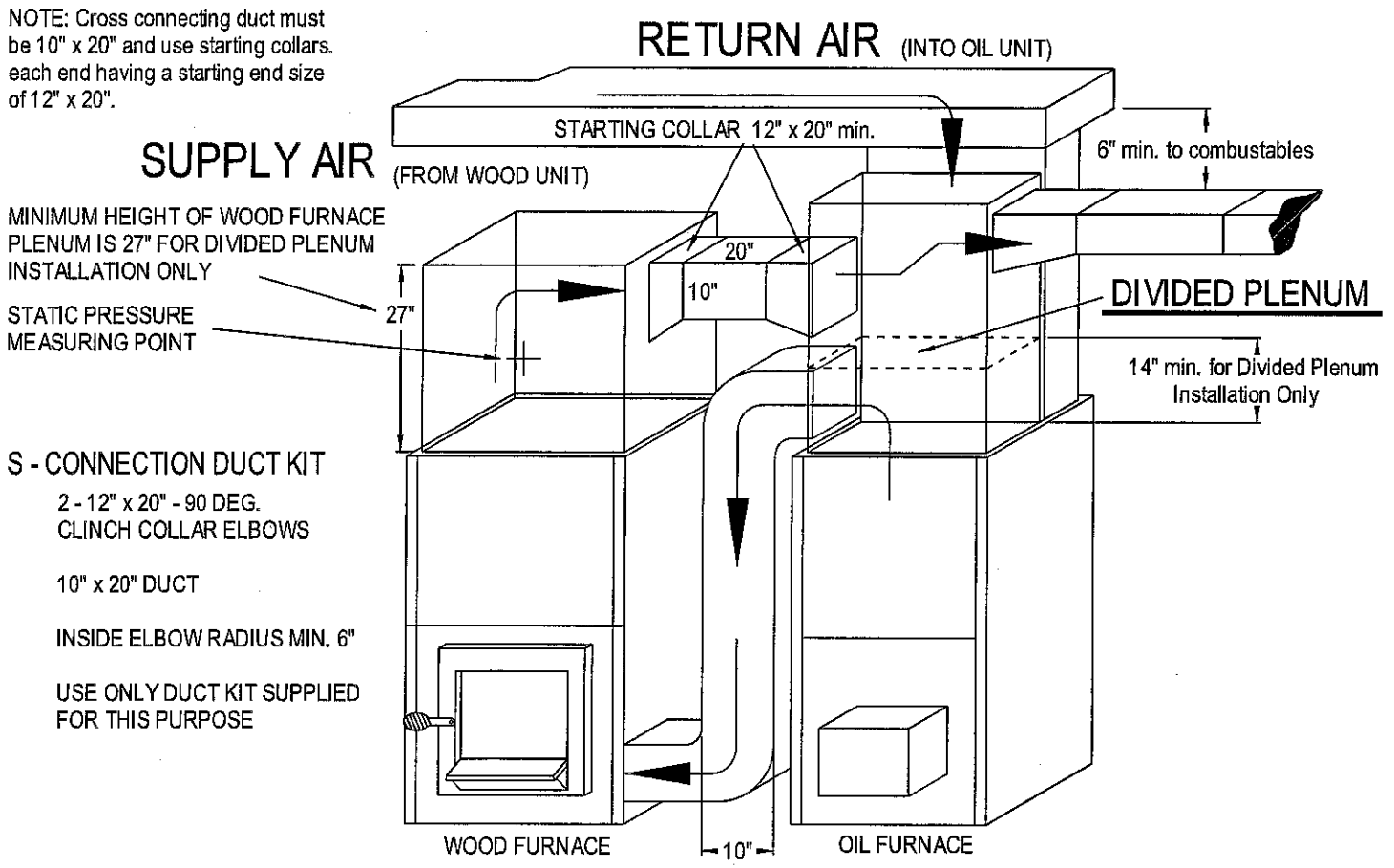
TOP VIEW



**BASE FOR USE ON COMBUSTIBLE FLOOR**  
**FIG. S202-3B**

202M0003JAN11

NOTE: Cross connecting duct must be 10" x 20" and use starting collars, each end having a starting end size of 12" x 20".



**SUPPLY AIR** (FROM WOOD UNIT)

**RETURN AIR** (INTO OIL UNIT)

MINIMUM HEIGHT OF WOOD FURNACE PLENUM IS 27" FOR DIVIDED PLENUM INSTALLATION ONLY

STATIC PRESSURE MEASURING POINT

**S - CONNECTION DUCT KIT**

2 - 12" x 20" - 90 DEG. CLINCH COLLAR ELBOWS

10" x 20" DUCT

INSIDE ELBOW RADIUS MIN. 6"

USE ONLY DUCT KIT SUPPLIED FOR THIS PURPOSE

**DIVIDED PLENUM**

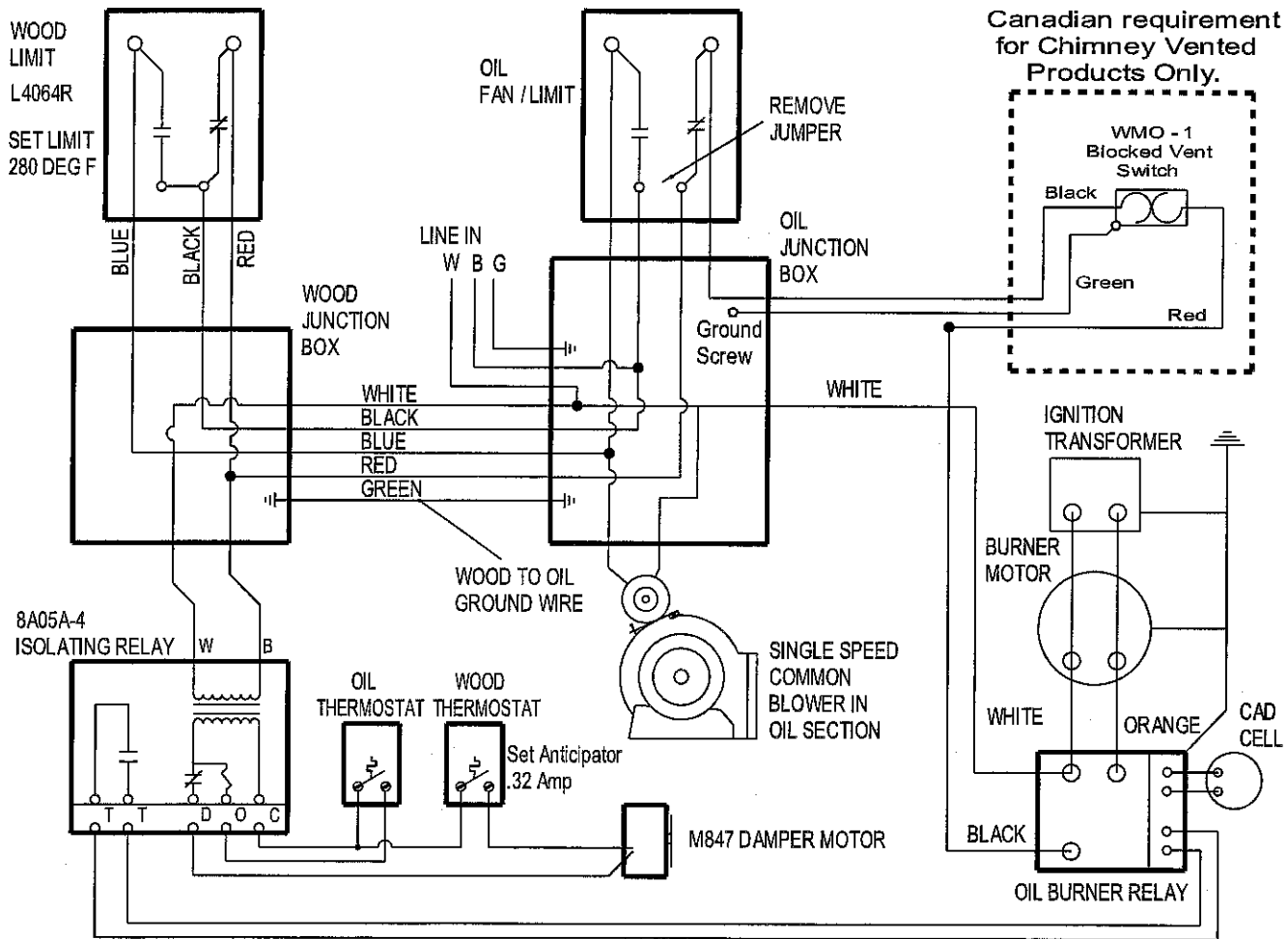
14" min. for Divided Plenum Installation Only

WOOD FURNACE

OIL FURNACE

**SCOTTY SS ADD ON TO OIL QUICK CONNECTION KIT "S" TYPE WITH DIVIDED PLENUM FIG. S202-4**

202M0004JAN11



NOTE: OIL THERMOSTAT SHOULD BE SET LOWER THAN WOOD THERMOSTAT

**SCOTTY SS ADD-ON TO OIL WIRING SCHEMATIC  
BELT DRIVE MOTOR**

**FIG. S202-5**

202M0005JAN11

# Wood Add-On to Classic Oil Furnace With Relay

## FIG. S202-6

Oil Furnace with Multi-speed blower motor and optional relay for Low Speed Air Circulation.

202M0006/AN11

Set oil thermostat down to operate wood furnace.

See control kit instructions for oil fan/limit installations

Install to code

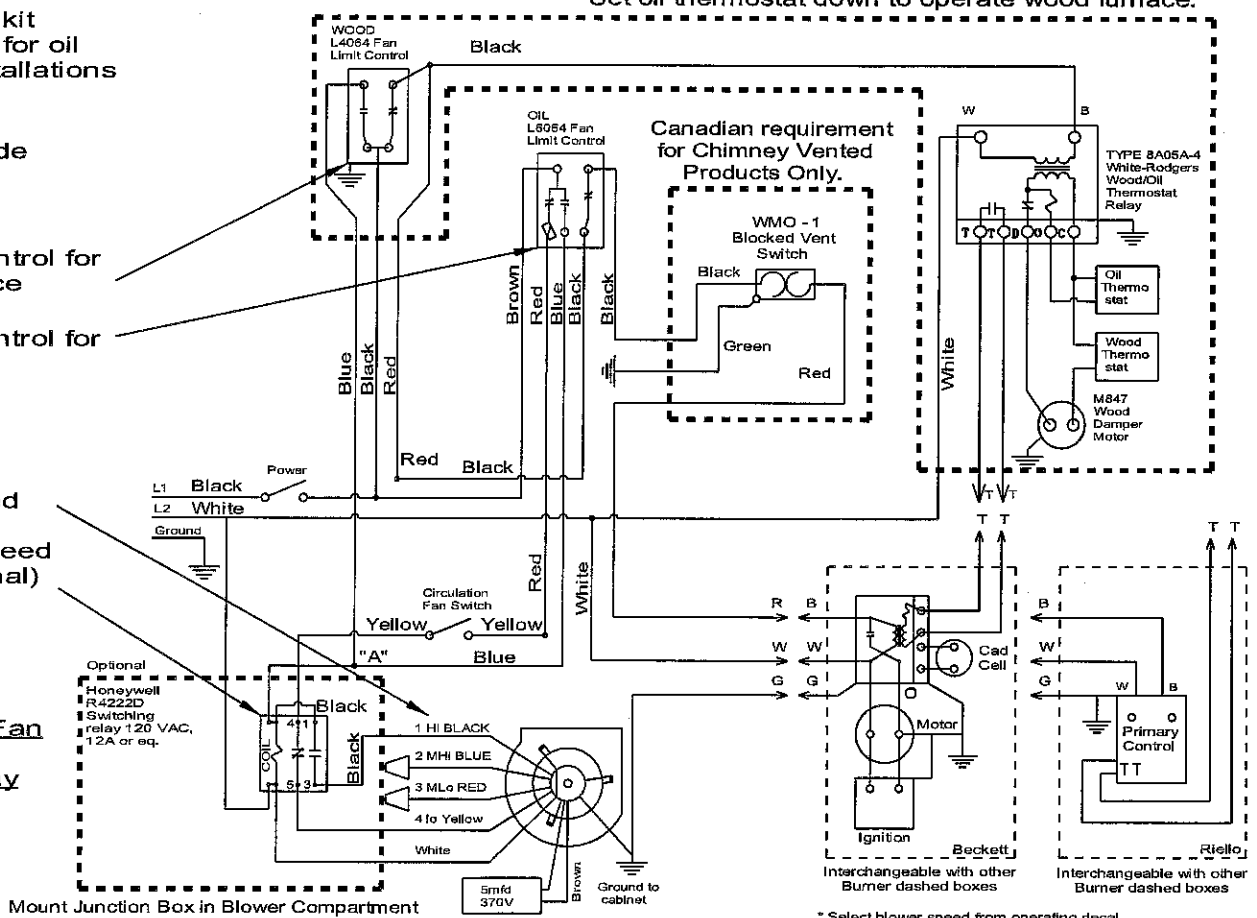
Fan/limit control for wood furnace

Fan/limit control for oil furnace

Set Hi blower speed

Install Lo speed relay (optional)

Disconnect Lo speed Circulation Fan Switch if optional relay is not used.



Mount Junction Box in Blower Compartment

\* Select blower speed from operating decal

# Wood Add-On to Classic Oil Furnace without Relay

## FIG. S202-7

Oil Furnace with Multi-speed Direct Drive Blower Motor  
 Low Speed Circulation Fan Switch Disconnected.

202M0007.JAN11

See control kit instructions for oil fan / limit installations

Install to code

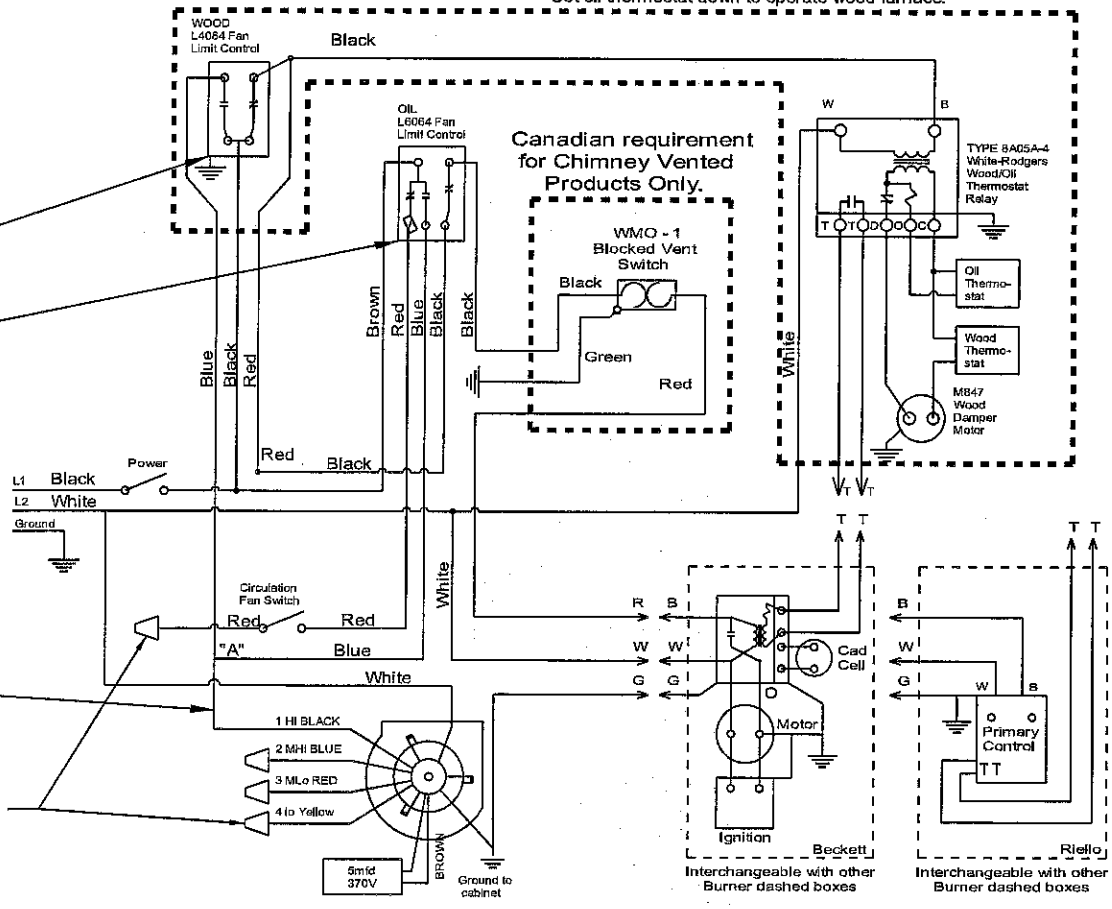
Fan / limit control for wood furnace

Fan / limit control for oil furnace

Set High blower speed

Low Speed Circulation Fan Switch Disconnected

Set oil thermostat down to operate wood furnace.



\* Select blower speed from operating decal



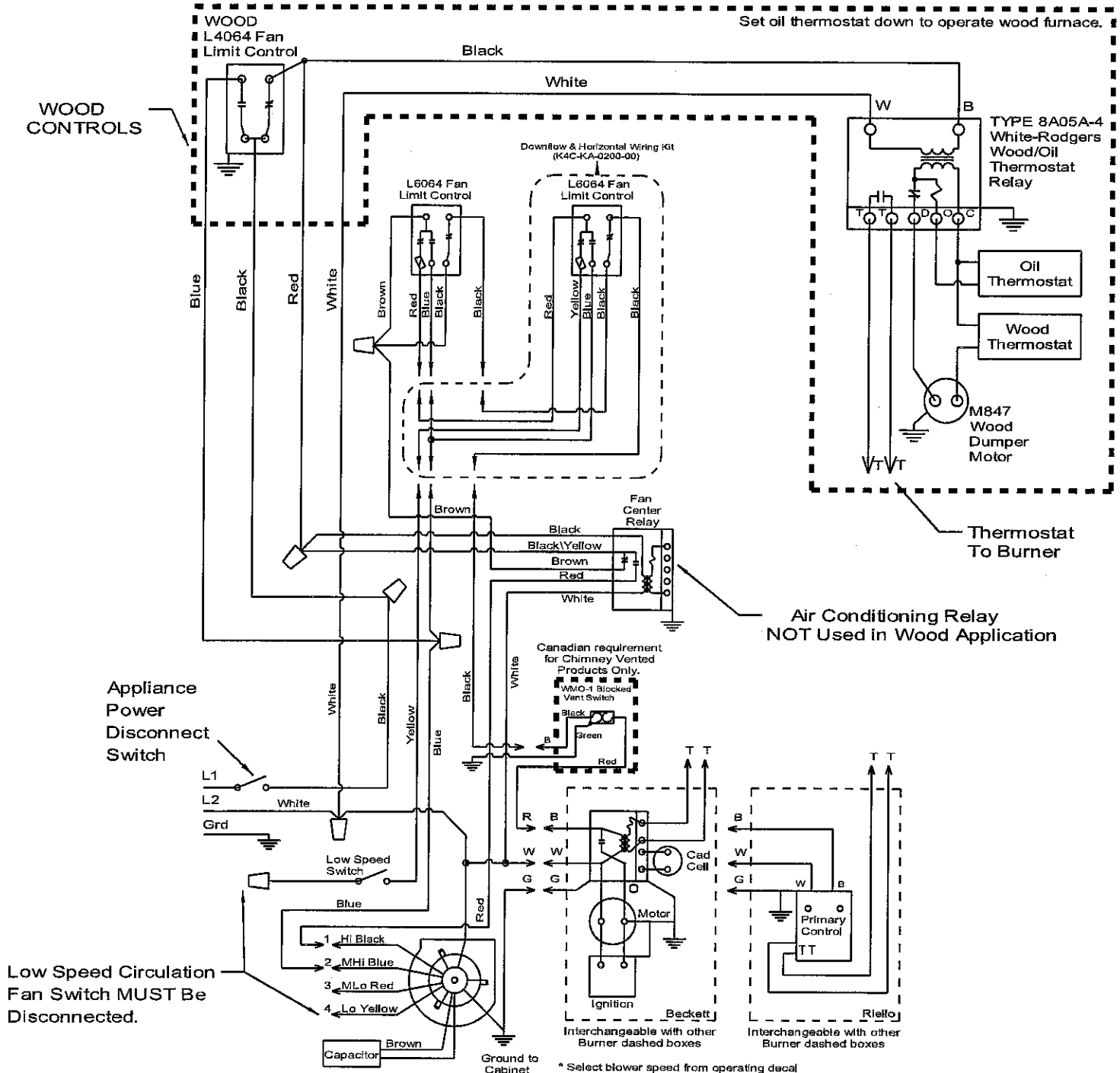
# Wood Add-On to Classic Air Oil Furnace without Relay

## FIG. S202 - 9

Oil Furnace with Multi-speed blower motor  
Low Speed Circulation Fan Switch Disconnected

S202M009JAN11

(USE COPPER CONDUCTORS ONLY)



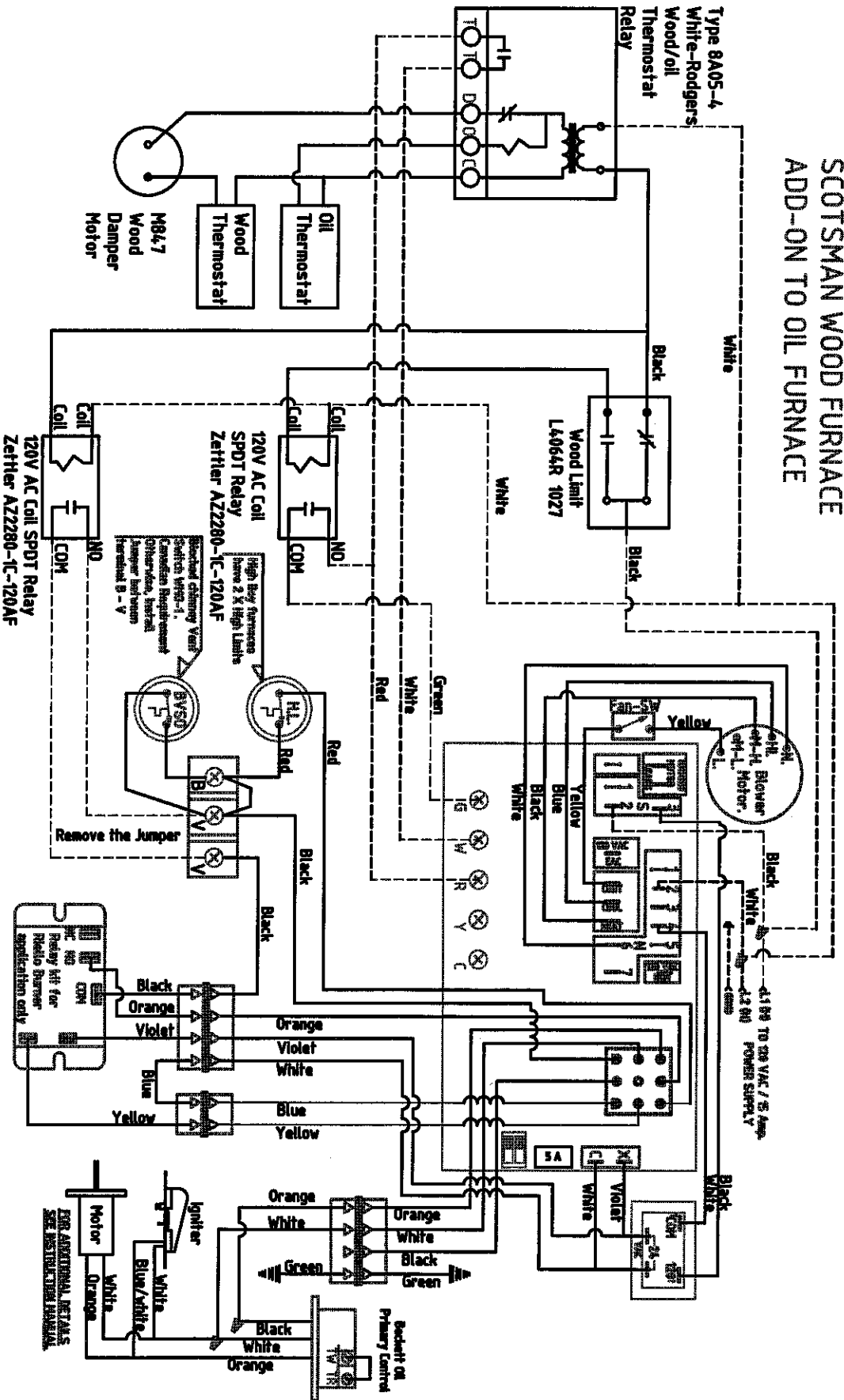


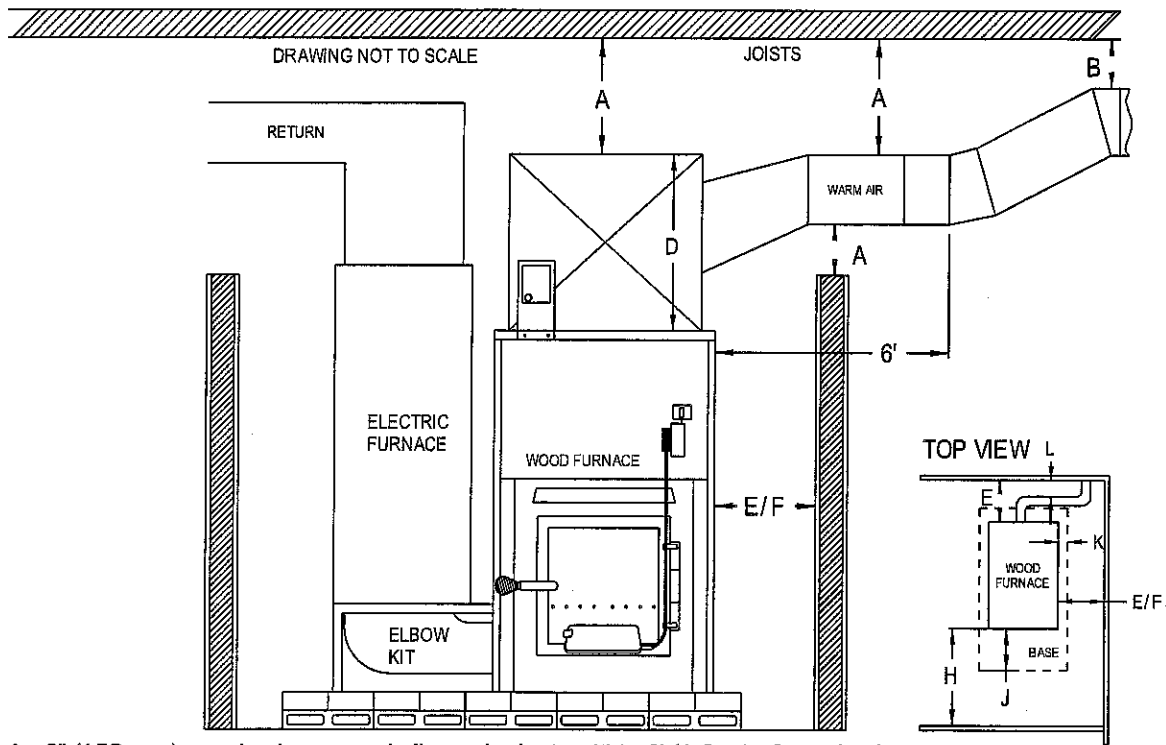


Classic Air Oil-Fired furnace Wood ADD-ON  
 ST9103A1028 Control Board with Beckett burner  
 FIG. S102-11

OIL-CLASSIC AIR RIELLO  
 WIRING DIAGRAM

SCOTSMAN WOOD FURNACE  
 ADD-ON TO OIL FURNACE



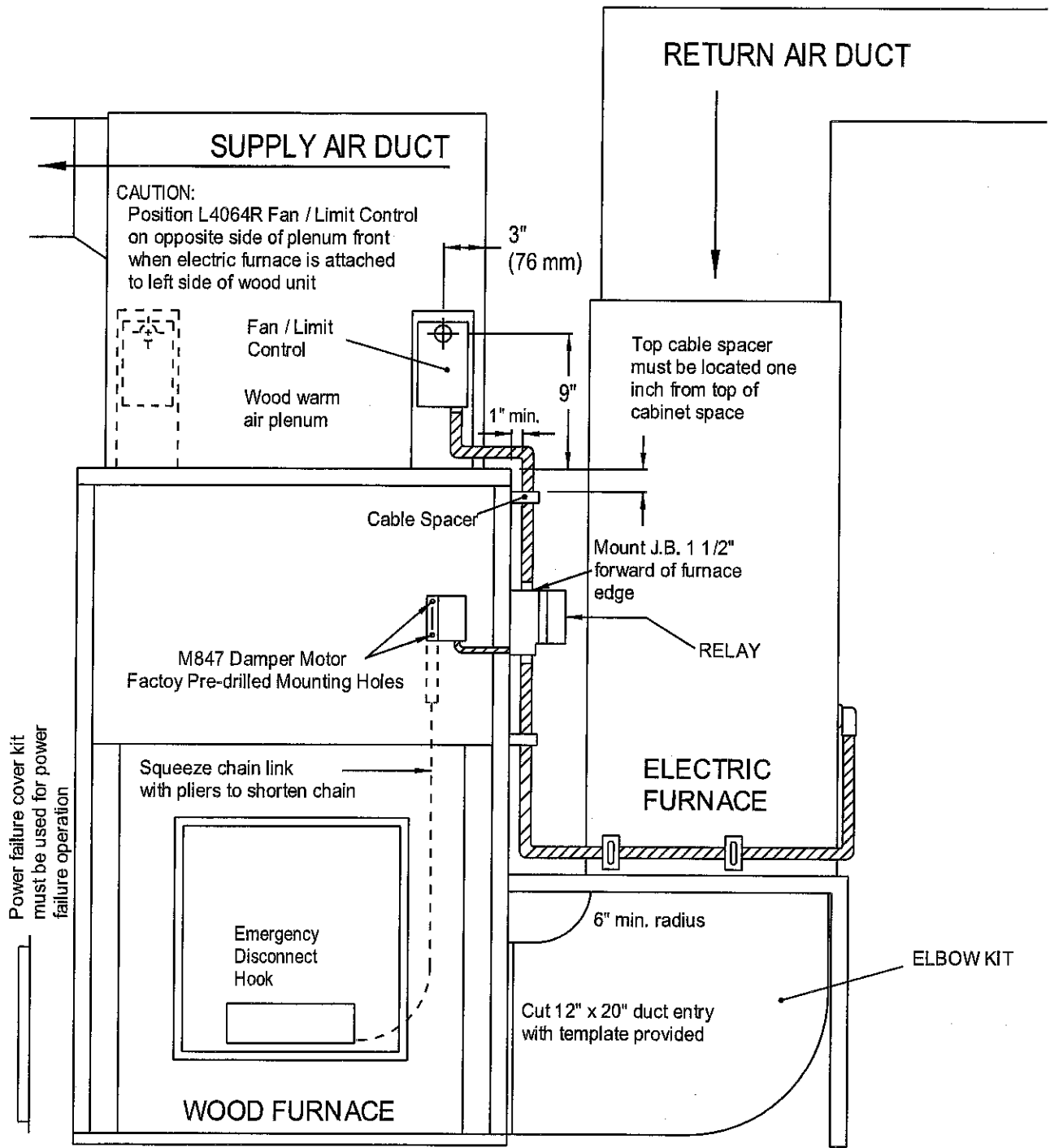


- A - 6" (152 mm) supply plenum and all supply ducts within 6' (1.8 m) of supply plenum.
- B - 2" (51 mm) all sides of warm air supply 6' (1.8 m) remote from plenum.
- C - 3" (76 mm) all sides of wood furnace return air plenum and return air duct within 6' (1.8 m) of plenum.
- D - 18" (457 mm) minimum warm air supply plenum height.
- E - 6" (152 mm) one side of furnace.
- F - 24" (610 mm) other side of furnace for access to rear.
- G - 24" (610 mm) rear clearance to combustibles. A rear clearance of 30" should be maintained for cleaning
- H - 48" (1220 mm) front clearance.
- J - 18" (457 mm) door side floor protecting pad (if not on concrete floor or concrete pad on ground).
- K - 8" (204 mm) floor protecting pad (if not on concrete floor or concrete pad on ground).
- L - 18" (457 mm) flue pipe to combustibles and electric services.

## CLEARANCES - ADD-ON TO ELECTRIC FURNACE

### FIG. S202-12

202M0012.JAN11

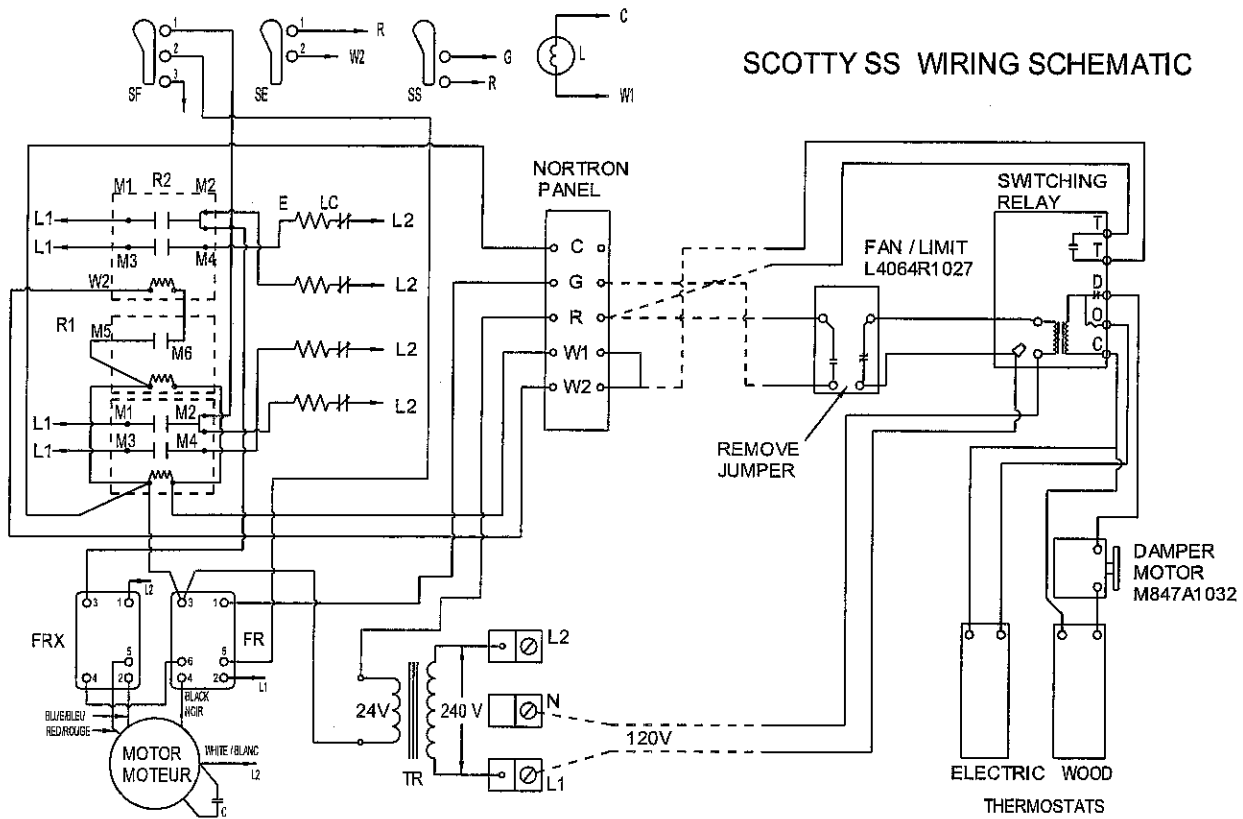


# SCOTTY SS DB202A WOOD - ELECTRIC ADD-ON INSTALLATION DIAGRAM

**FIG. S202-13**

**NORTRON ELECTRIC FURNACE  
MODEL FRK-20 (4 ELEMENT) SHOWN**

CAUTION: THIS EQUIPMENT MAY ONLY BE INSTALLED  
AND TESTED BY QUALIFIED PERSONNEL



240 VOLTS AC SINGLE PHASE

\* NOTE - REMOVE FAN/LIMIT JUMPER

**SCOTTY SS DB202A WOOD - ELECTRIC ADD-ON ELECTRICAL SCHEMATIC**

FIG. S202 - 14

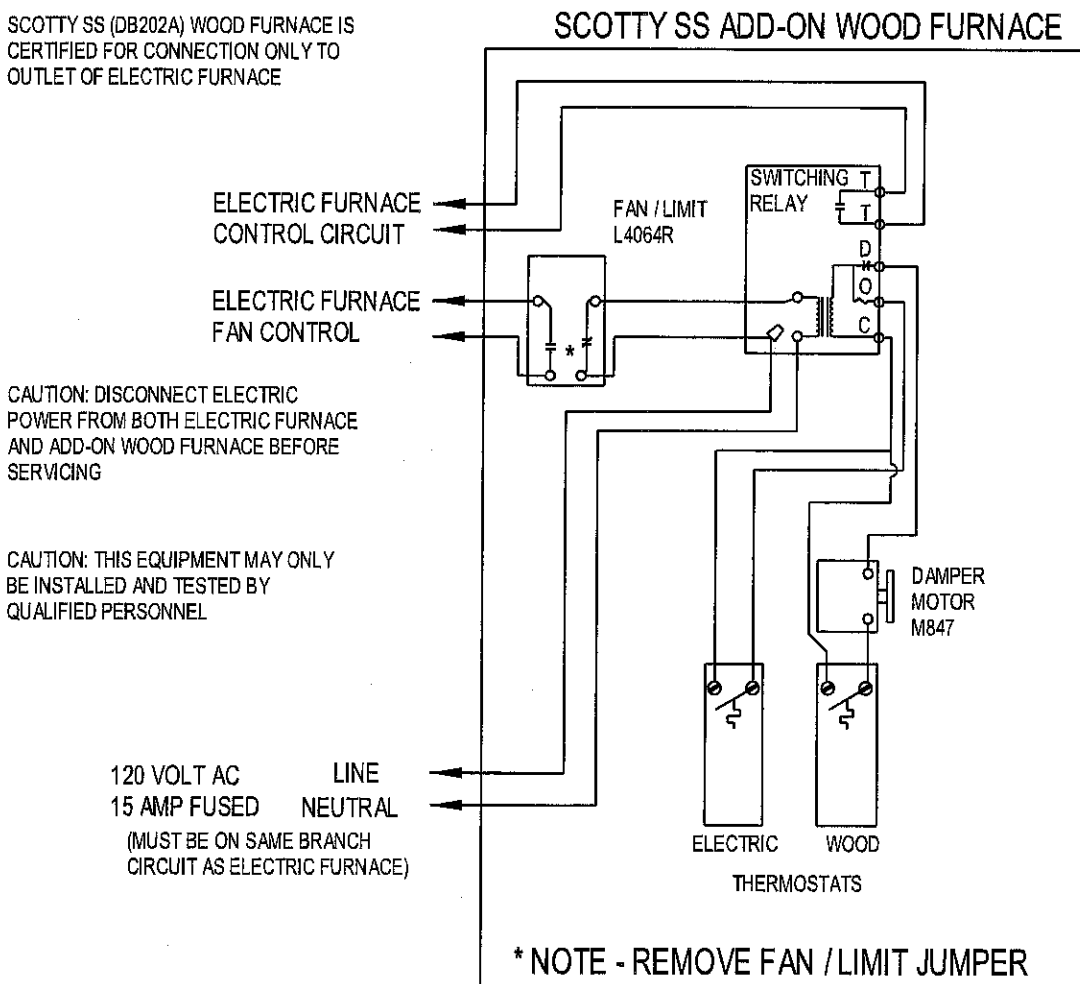
**NORTRON FRK10H - 30 SERIES FURNACE**

202M0014/JAN11

**OTHER ELECTRIC FURNACE  
 APPROVED TO CSA C22.2 NO.23 - 1980  
 ELECTRIC CENTRAL WARM AIR FURNACES**

**SCOTTY SS (DB202A) MAY BE ADDED TO AN ELECTRIC FURNACE HAVING  
 A RATING AS SHOWN ON THE ORIGINAL NAMEPLATE BETWEEN 10 KW  
 AND 25 KW PROVIDED THAT THE BLOWER IN THE ELECTRIC FURNACE  
 IS THAT USED IN THE 20 KW VERSION OF THE ELECTRIC FURNACE**

SCOTTY SS (DB202A) WOOD FURNACE IS  
 CERTIFIED FOR CONNECTION ONLY TO  
 OUTLET OF ELECTRIC FURNACE

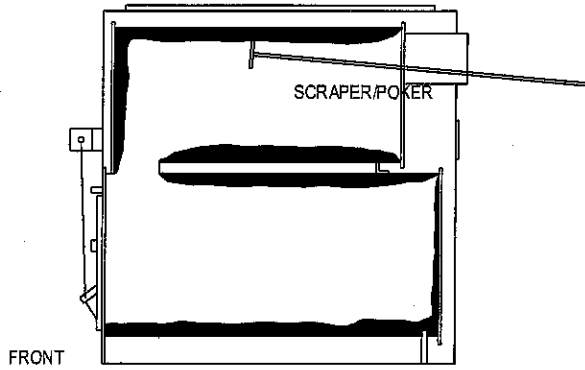


NOTE: SET ELECTRIC THERMOSTAT LOWER THAN WOOD THERMOSTAT

ALL ELECTRICAL WIRING MUST CONFORM TO NATIONAL AND LOCAL CODES. WIRING TO FAN/LIMIT CONTROL SHOULD BE 105 DEG. C TEW. MOUNT WIRING ON STANDOFF BRACKETS PROVIDED IN KIT "E".

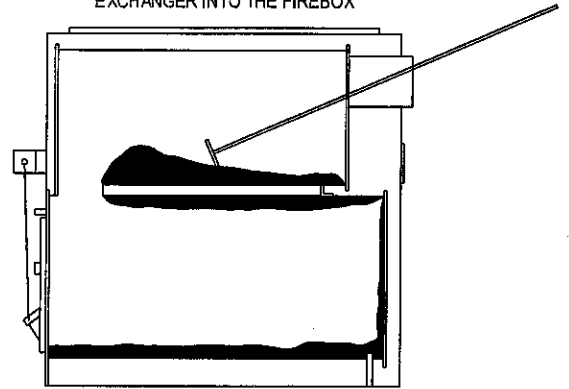
**SCOTTY SS (DB202A) WOOD - ELECTRIC ADD-ON  
 ELECTRICAL SCHEMATIC FIG. S202 - 15  
 APPROVED ELECTRIC FURNACE**

USING PROVIDED SCRAPER/POKER REMOVE  
CREOSOTE FROM HEAT EXCHANGER



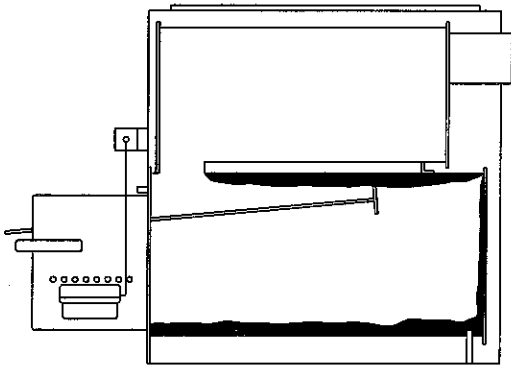
A

PUSH CREOSOTE FROM HEAT  
EXCHANGER INTO THE FIREBOX



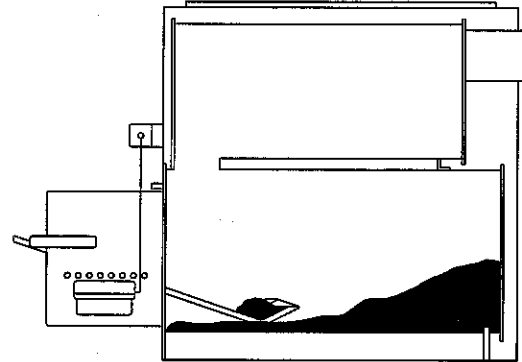
B

REMOVE CREOSOTE FROM THE TOP  
AND REAR OF THE HEAT FIREBOX



C

SHOVEL ALL CREOSOTE FROM THE FIREBOX THROUGH  
THE FRONT DOOR AND REPLACE THE FLUE PIPE



D

(CREOSOTE AMOUNTS EXAGGERATED)

# CLEANING FIG. S202-16

202M0016JAN11

# APPROVED FURNACE DUCTWORK CONFIGURATIONS

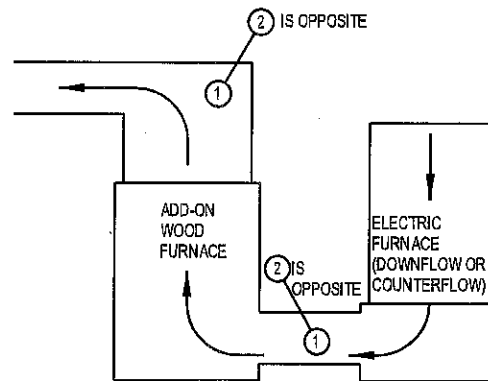
## FIG. S202-17

202M0017 JAN11

The following three ductwork configurations are approved:

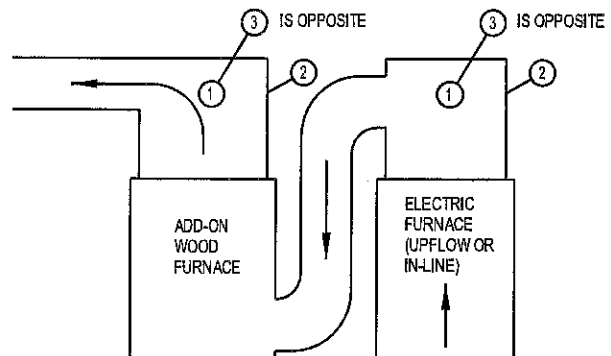
**APPROVED 1** - Typical ductwork for add-on to an electric downflow furnace.

1 and 2 are static pressure test points.



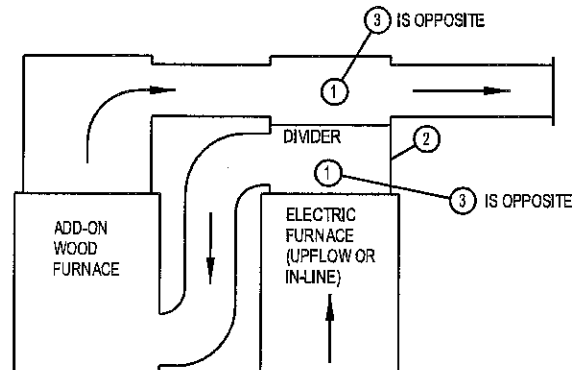
**APPROVED 2** - Typical ductwork for add-on to an electric upflow furnace with straight-through (non Divided) plenum.

1 and 2 are static pressure test points.



**APPROVED 3** - Typical ductwork for add-on to an electric upflow furnace - divided plenum.

1,2 and 3 are static pressure test points.





# PROHIBITED FURNACE DUCTWORK CONFIGURATIONS

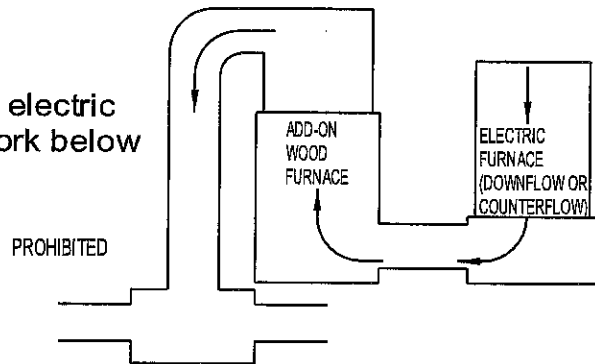
## FIG. S202-18

202M0018

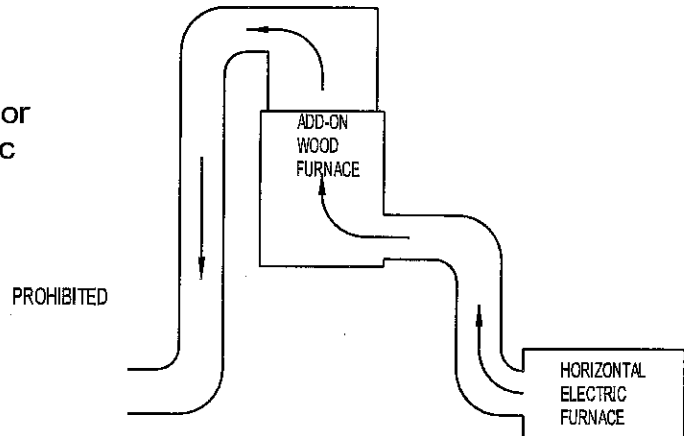
UNDER NO CIRCUMSTANCES CAN THE FOLLOWING CONFIGURATION BE USED

The following three ductwork configurations are prohibited:

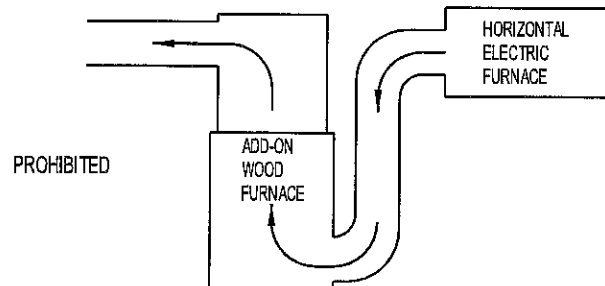
**PROHIBITED 4** - Ductwork for add-on to an electric downflow furnace - Ductwork below furnace.



**PROHIBITED 5** - Ductwork for add-on to floor mounted horizontal electric furnace.



**PROHIBITED 6** - Ductwork for add-on to a ceiling mounted horizontal electric furnace.



Layouts 4,5 and 6 are PROHIBITED because of the danger of reverse flow occurring under power failure conditions. The location of the supply and return ducts are such that the natural convection of heat will not occur through the supply ducts.