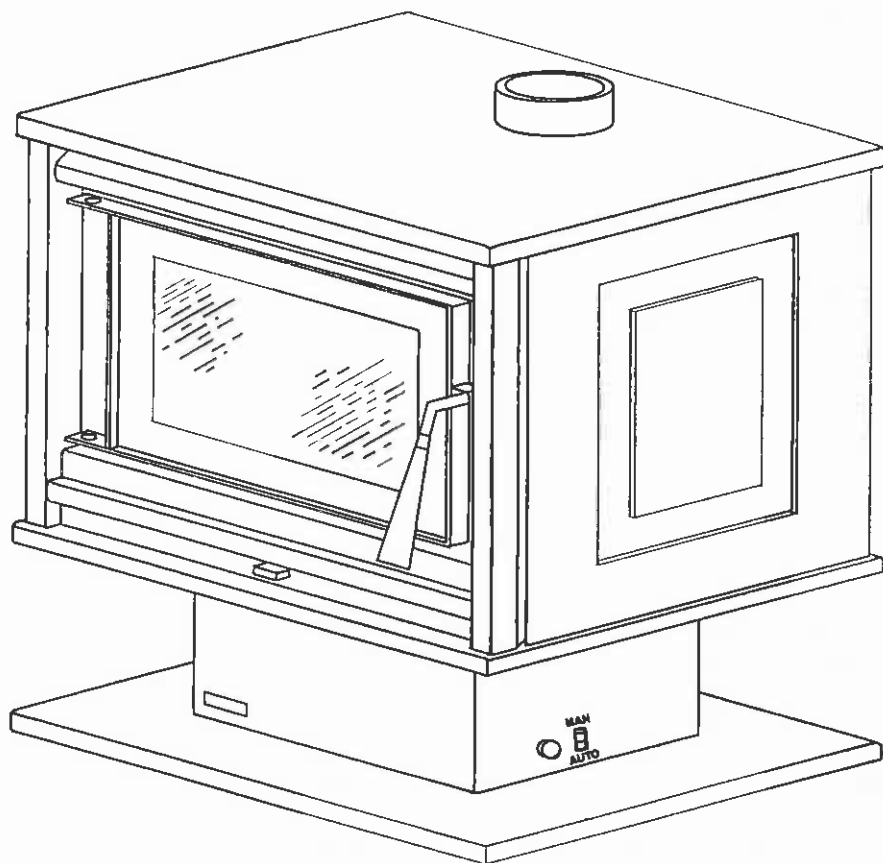




MODEL 1890 WOOD HEATER

INSTALLATION INSTRUCTIONS & OPERATION GUIDE



LISTINGS AND CODE APPROVALS

This manual describes the installation and operation of the ARROW® Model 1890 wood heater. This heater meets the U.S. Environmental Protection Agency's 1990 particulate emission standards. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 11,200 to 42,700 BTU/HR.

The ARROW® Model 1890 is listed by Warnock Hersey to UL Safety Standard 1482 and ULC Safety Standard S627. This model can also be installed in mobile homes (USA only).

Check with your local building code agency before you begin your installation to insure compliance with local codes, including the need for permits and follow-up inspections. Be sure local building codes do not supercede UL specifications and always obtain a building permit so that insurance protection benefits cannot be unexpectedly canceled.

heatilator
The first name in fireplaces

ARROW® is a registered trademark of Heatilator Inc., Division, HON INDUSTRIES.

FOR YOUR SAFETY

THROUGHOUT THIS GUIDE, WHENEVER YOU SEE THIS SYMBOL, THE INFORMATION THAT FOLLOWS IS VITAL TO THE SAFE INSTALLATION AND OPERATION OF THIS APPLIANCE.

- THE OUTSIDE SURFACES OF THIS UNIT WILL BECOME EXTREMELY HOT DURING USE SO ALWAYS KEEP CHILDREN AWAY WHILE IT IS OPERATING AND DO NOT LET ANYONE OPERATE THIS APPLIANCE UNLESS THEY ARE FAMILIAR WITH THE INSTRUCTIONS IN THIS GUIDE.
- FAILURE TO PROPERLY INSTALL THIS UNIT COULD CAUSE A SERIOUS FIRE HAZARD.
- DO NOT INSTALL THIS UNIT WHERE GASOLINE, KEROSENE, CHARCOAL LIGHTER FLUID, PAINT THINNER OR ANY OTHER FLAMMABLE LIQUID IS STORED OR USED.

IT IS VERY IMPORTANT THAT YOU READ THROUGH THIS GUIDE COMPLETELY AND UNDERSTAND EACH ITEM. DO NOT APPLY ANY SHORTCUTS. WHERE WE TELL YOU A 12 INCH CLEARANCE IS REQUIRED, DO NOT TRY TO MAKE DO WITH 11 INCHES. WHEN THE INSTRUCTIONS SAY TO USE 3 SCREWS, DON'T TRY TO SAVE TIME BY USING ONLY 2. WE ARE CONFIDENT THAT THIS INSTALLATION WILL BE TROUBLE-FREE IF YOU FOLLOW OUR LEAD.

ARROW® STOVES COME COMPLETE, NEEDING ONLY CHIMNEY CONNECTIONS AND PROTECTION FOR COMBUSTIBLE FLOORS.

⚠ DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE THAT SERVES ANY OTHER APPLIANCE.

⚠ DO NOT INSTALL IN A SLEEPING ROOM.

GENERAL INFORMATION

Read through each step carefully and follow the instructions precisely. Take special note of all precautions. They are there for your protection.

We will take you step by step through a normal installation, and we have also included instructions for mobile home use.

It's a good idea to plan your installation on paper, using exact measurements for clearances and floor protection, before actually beginning the installation. If you're not using an existing chimney, place the stove where there will be clear passage for a factory-built listed chimney through the ceiling and roof.

One more important step to take before you begin installing is to have a qualified building inspector review your plans.

MINIMUM CLEARANCES TO COMBUSTIBLES

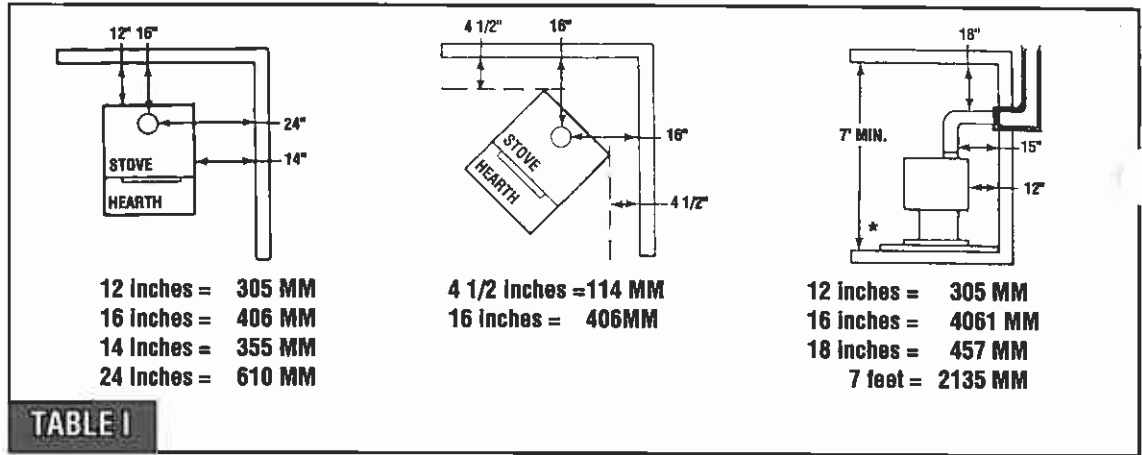
The clearances listed in Figure 1 are the minimum distances that must be maintained.

Use the minimum clearances shown in Table I for installation with a single wall connector. The single wall connector must be at least 24 gauge mild steel or 26 gauge blue steel. Some clearances may be reduced as shown in Table II by using one of the listed chimney connectors shown on page 6 attached directly to the stove.

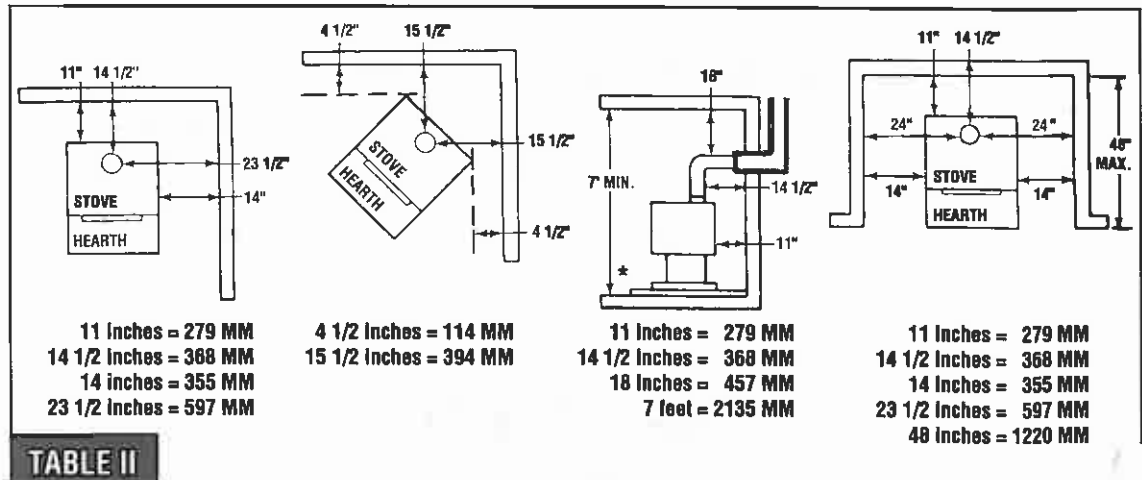
If further reduced clearances are needed, obtain requirements for construction of a protected wall from your local building code authorities and their allowable reductions of the listed clearances.

CLEARANCES USING SINGLE WALL CONNECTOR (STOVEPIPE)

(SINGLE WALL CONNECTOR MUST BE AT LEAST 24 GAUGE MILD STEEL OR 26 GAUGE BLUE STEEL.)



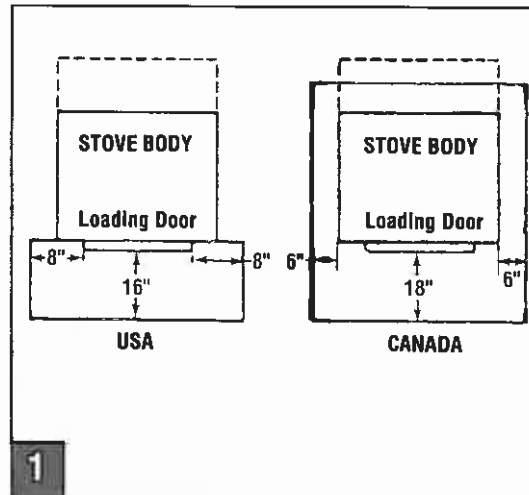
CLEARANCES USING LISTED CHIMNEY CONNECTOR.



*On through-the-wall chimney installations, floor protection must extend past the back of the stove to the rear wall. See page 3 for complete floor protections requirements.

FLOOR PROTECTION

The floor must be non-combustible or otherwise protected by a 3/8" thick metal clad millboard floor protector (or equivalent). (Figure 2). The stove base meets these requirements for the area directly beneath the unit. However, protection must extend at least 16" in front and 8" to either side of the loading door (in Canada, 18" in front and 6" to either side and rear of the stove itself). (Figure 1)



NOTE: Dotted line indicates additional floor protection required on through-the-wall chimney installation. Floor protection must extend behind the stove to the rear wall.

Non-combustible decorative covering or .018 min. sheet metal

Insulation min. R value 1.31

EXAMPLES OF MILLBOARD

| | Required Thickness | K Value |
|-------------------------------------|--------------------|---------|
| 15 LB/FT ² Mineral board | 3/8" | .29 |

(Thermal Conductivity) "K" = BTU In./hr. ff F

To substitute alternate insulation material, you need to know the "K" factor for that material. To calculate the required thickness for the alternate material use the following formula:

$$\frac{K \text{ Alt.}}{.29} \times .38 = \text{Thickness of alternate mat. (Inches)}$$

K of brick = 5

$$\frac{5}{.29} \times .38 = 6.55 \text{ in. of brick.}$$

2

OUTSIDE COMBUSTION AIR

It may be necessary to use outside combustion air if you're installing this appliance in a house that is tightly constructed. Outside combustion air is required in mobile home installations or where local codes require its use. The Outside Air Kit, AK 90, is required and comes with items necessary for bringing in outside air.

To bring in outside combustion air, you will need to cut a hole in the floor under the stove. The pedestal serves as a duct to bring the air up to the air intake opening on the bottom of the stove body. Place the unit so you will have clear access through the floor. Do not cut floor joists that could damage the structure of the floor. Check around the foundation or mobile home skirting to make sure there is a clear passage of outside combustion air.

MOBILE HOME INSTALLATION (USA ONLY)

The ARROW® 1890 can be easily installed in a mobile home with our Outside Air Kit AK 90 and by following the installation diagram in Figure 3.

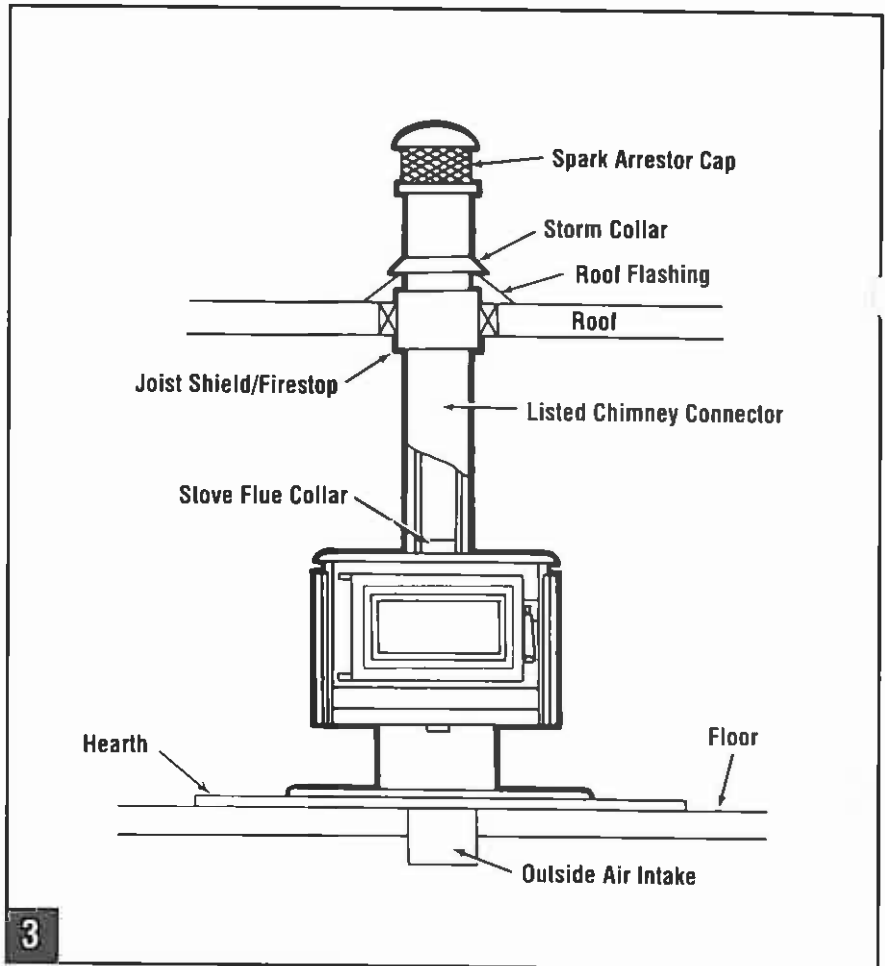
Important requirements for Mobile Home Installation:

- Do not install in a sleeping room.
- An outside combustion air source is required.
- The stove must be securely attached to the floor with lag screws from the Outside Air Kit AK 90.
- The combined weight of the stove, chimney connector and hearth protection must be spread over an area so you will not exceed the 40 pound per square foot load limit.
- Floor protection requirements must be followed precisely.
- This unit must be installed with one of the pre-fabricated listed metal chimneys, connectors, and terminal caps with spark arrestor as shown in the manual. Never use a single wall connector (stove-pipe) in a mobile home installation.

Follow the chimney and chimney connector manufacturer's instructions when installing the flue system for use in a mobile home.

NOTE: The top sections of chimney must be removable to allow a maximum clearance of 13½ feet/4114 mm. from the ground level for transportation purposes.

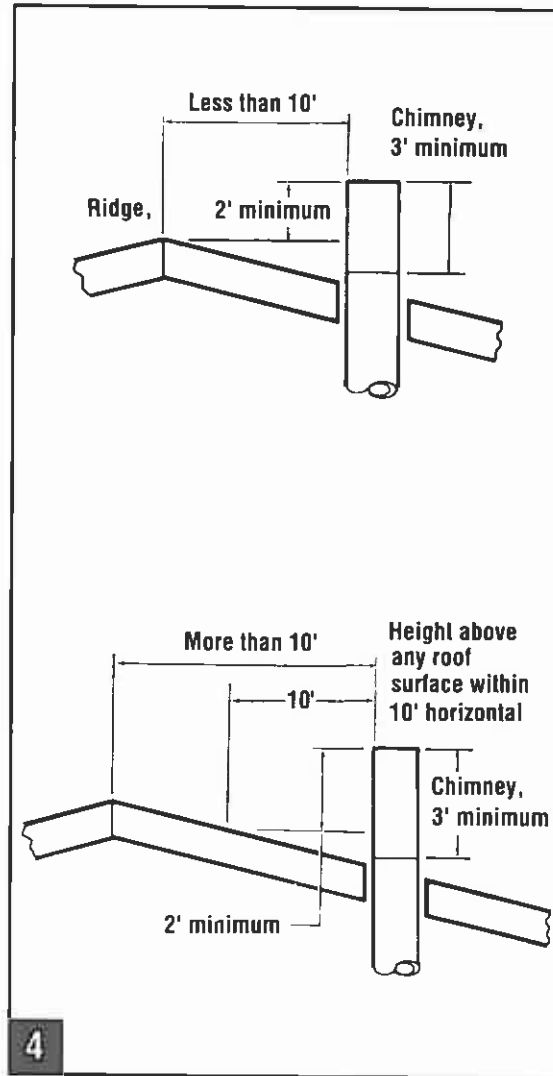
⚠ NEVER DRAW COMBUSTION AIR FROM A WALL, FLOOR OR CEILING CAVITY OR FROM ANY ENCLOSED SPACE SUCH AS AN ATTIC OR GARAGE.



CHIMNEY HEIGHT REQUIREMENTS

Regardless of whether you use a masonry chimney or a listed metal chimney it must be the required height above the roof or other obstructions. The minimum requirement is that the chimney must be at least 3 feet higher than the highest point where it passes through the roof and at least 2 feet higher than the highest part of the roof or structure that is within 10 feet of the chimney, measured horizontally. The height requirement is necessary in the interest of safety and does not necessarily assure proper flue draft. (Figure 4)

We recommend using a minimum total system height of 12 feet, measured from the stove flue collar to the top of the chimney, not including the chimney cap when using single wall connector pipe. When using listed connector pipe for close clearance or in mobile homes, we recommend using a minimum total system height of 9 feet, measured from the stove flue collar to the top of the chimney.



SAFETY WARNINGS

ALWAYS FOLLOW CHIMNEY CONNECTOR MANUFACTURER'S INSTRUCTION FOR PROPER INSTALLATION.

CHIMNEY CONNECTOR IS TO BE USED ONLY WITHIN THE ROOM, BETWEEN THE STOVE AND CEILING OR WALL, NEVER PASSING THROUGH A COMBUSTIBLE CEILING OR WALL. MAINTAIN CLEARANCES TO COMBUSTIBLES AS DESCRIBED IN TABLES I AND II.

IF INSTALLING THIS MODEL TO A MASONRY CHIMNEY, ALWAYS BE SURE THE CHIMNEY IS IN GOOD CONDITION AND THAT IT MEETS THE MINIMUM STANDARDS OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARD 211.

THIS WOOD BURNING APPLIANCE IS MADE WITH A 6 INCH/152 MM. DIAMETER FLUE COLLAR. USE ONLY THE SAME DIAMETER CHIMNEY CONNECTOR (IF YOU ARE USING A FACTORY BUILT CHIMNEY SYSTEM, AS RECOMMENDED) AS THE FLUE COLLAR ON THE UNIT.

CHANGING THE DIAMETER OF THE CHIMNEY CAN AFFECT DRAFT AND CAUSE POOR PERFORMANCE. IT IS NOT RECOMMENDED TO USE OFFSETS OR ELBOWS AT ALTITUDES ABOVE 4000 FEET ABOVE SEA LEVEL OR WHEN THERE ARE OTHER FACTORS THAT AFFECT FLUE DRAFT.

Flue Systems

There are two separate and different parts to a flue system: The chimney connector and the chimney itself.

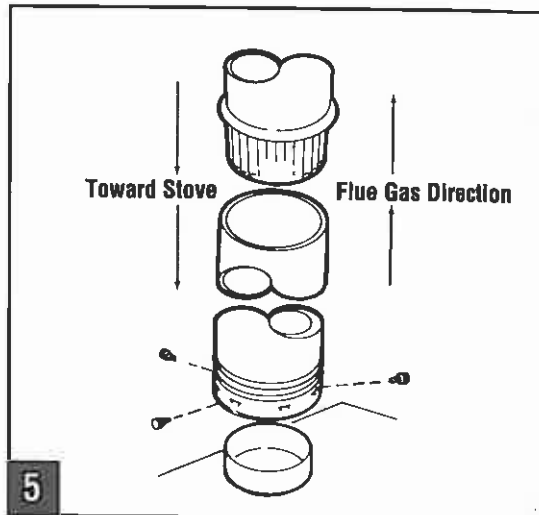
Chimney Connector

The Chimney Connector connects the stove to the chimney. The connector must be the same size as the flue outlet of the stove. There are two types of chimney connectors.

- A. Single wall connector, or stovepipe. This must be at least 24 gauge mild steel or 26 gauge blue steel. The sections must be attached to the stove and to each other with the crimped (male) end pointing toward the stove. All joints, including the connection at the stove collar, should be secured with three sheet metal screws. Make sure to maintain clearances in Figure 1.
- B. Factory built listed chimney connector. There are 7 brands of connectors listed for use with this unit. Using one of these connectors allows the reduced clearances to combustibles as shown in Table II. A listed connector must be used when installing this unit in a mobile home. Listed chimney connectors must be used in conjunction with the same brand of listed chimney.

Listed Chimney Connectors

| Manufacturer | Model/Style Description |
|-------------------------|-------------------------|
| Oliver Macleod | Pro Vent PV |
| Simpson Dura-Vent | DVL |
| Selkirk-Metalbestos | VS-DK, DS |
| GSW Jackes-Evans | Superpipe 6 |
| Security Chimneys, Ltd. | DL, DL42A |
| American Metal Products | DBSP Amertec |
| Metal Fab | Temp/Guard DWB |



NOTE: The chimney connector must be attached to either an approved masonry chimney or one of the listed factory built chimneys shown on pages 8 & 9.

MASONRY CHIMNEY

Be sure a masonry chimney meets the minimum standards of the National Fire Protection Association (NFPA) Standard 211. It must have at least a 5/8 inch/16 mm. fire clay liner or a listed chimney liner system. Make sure there are no cracks, loose mortar or other signs of deterioration and blockage. It is best to have the chimney inspected by a professional and be sure to have the chimney cleaned before the stove is installed and operated.

The flue size of the masonry chimney should be between 36 and 96 square inches/914 and 2438 mm. It is recommended that a chimney with a larger diameter be relined to meet these requirements because smaller or larger flue sizes can affect draft and cause poor performance. (See page 13 for more information about draft.)

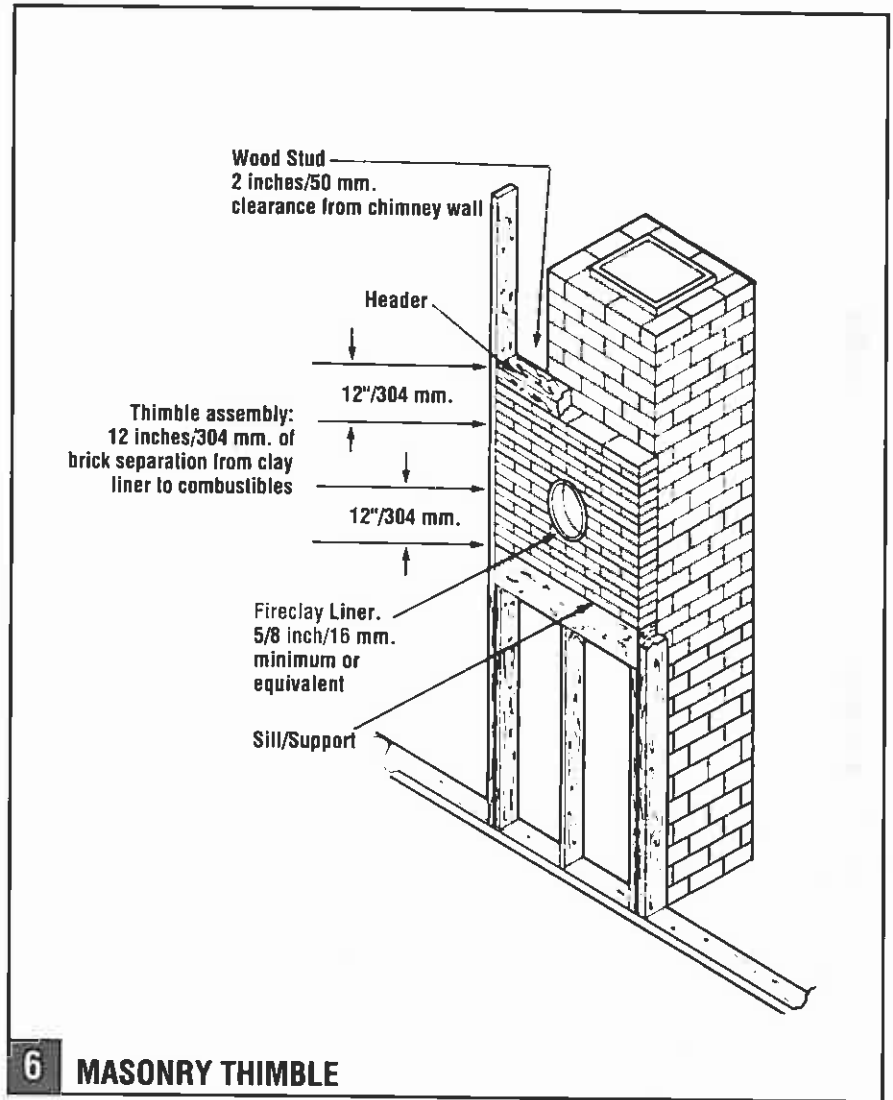
NOTE: Never install more than one appliance to any chimney.

When connecting the stove through a combustible wall to a masonry chimney, special methods are needed. There are several ways to make this connection, including the construction of a masonry thimble. Check with your local building authorities or consult the National Fire Protection Association (NFPA 211). Refer to Figure 6.

MASONRY THIMBLE

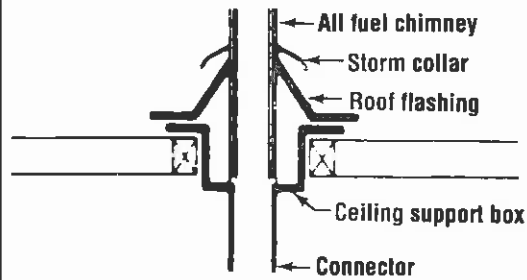
Listed Factory Built Chimney

If using a listed factory built chimney, be sure it is one of the residential type and building heating appliance chimneys shown (Figure 7) and on pages 8 and 9. Follow the installation instructions provided by the chimney manufacturer and maintain the specified clearances to combustibles.

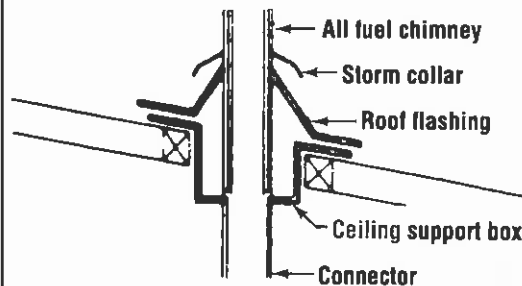


NOTE: Special construction methods are necessary when passing a chimney or connector through a wall or ceiling. Carefully follow the chimney manufacturer's instructions and local building codes.

FOR FLAT CEILINGS



FOR VALUTED CEILINGS



7

GSW JACKES-EVANS CHIMNEY COMPONENTS (USA) GSW (CANADA)

1. Sections of JSC6SA 2100 degree chimney to reach the height required in these instructions, in Canada JM6S Super Chimney 2100.
2. (1) J586ASE chimney adapter for use with single wall connector, or (1) 6SP6CA1 chimney adapter for use with Super Pipe 6 connector pipe.
3. (1) JSC6MHK ceiling support kit consisting of:
 - (1) JSC6CCSB ceiling support box with draw band
 - (1) J6CT black ceiling trim
 - (1) JSC6AAF-GA adjustable flashing assembly
 - (1) JSC6ASC-GA storm collar
 - (1) JSC6RCMH stainless steel rain cap with spark arrestor
4. Section of JSP6P or JSP6TL and JSP6SA Super Pipe 6 chimney connector pipe or single wall connector pipe to reach from stove flue collar to chimney.

DURA-VENT SDP DURA PLUS CHIMNEY COMPONENTS (FOR USA USE ONLY)

1. Sections of Dura Plus SDP 6" chimney to reach the height required in these instructions.
2. (1) Dura Plus SDP mobile home kit 6DPMH 9096 consisting of:
 - (1) 9048B 24" support box,
 - (1) 9016 starter section,
 - (1) 9014 1 ft. chimney section,
 - (1) or 9021 2 ft. chimney section,
 - (1) or 9049 roof flashing,
 - (1) or 9059 storm collar,
 - (1) or 9084 stainless steel top with spark arrestor.
3. Sections of DVL chimney connector or single wall stove pipe to reach from stove flue collar to chimney

METALBESTOS CHIMNEY COMPONENTS (USA)
ELKIRK METALBESTOS (CANADA)

1. Sections of 6" SSII type HT chimney to reach the height required in these instructions. In Canada, Sentinel chimney.
2. (1) 6" SJSMH mobile home joist shield.
3. (1) 6" T-SFA roof flashing.
4. (1) 6" SCT storm collar.
5. (1) 6" T-SA round top cap with spark arrestor.
6. Sections VS-DK or DS chimney connector or single wall connector pipe to reach from stove flue collar to chimney.

AMERITEC CHIMNEY COMPONENTS (FOR USA USE ONLY)

1. Sections of Ameritec DBSP 6" connector pipe and 18A adjustable length to reach from stove to ceiling.
2. Sections of 6HS chimney to reach the height required in these instructions.
3. (1) 6" stove collar adapter,
4. (1) 6" chimney connector ring,
5. (1) or 6HS-CSA ceiling support box with adapter,
6. (1) 6HS-AIS attic insulation shield,
7. (1) 6FB-RF roof flashing,
8. (1) 6FB-SC storm collar,
9. (1) 6HS-RCS cap with spark arrestor,
10. Sections of DBSP chimney connector or single connector pipe to reach from stove flue collar to chimney.

SECURITY CHIMNEY COMPONENTS

1. Sections of 6" 6L ASHT (USA) S 2100 (CANADA) chimney to reach the height required in these instructions.
2. (1) 6RSA joist/radiation shield.
3. (1) 6" F, FP, FA, FB, or FBB roof flashing with storm collar.
4. (1) 6 CPE spark arrestor cap.
5. Sections of DL or DL42A chimney connector or single wall connector pipe to reach from stove flue collar to chimney.

OLIVER MACLEOD PRO-JET CHIMNEY COMPONENTS

1. Sections of 6" Hi-Temp 3000 chimney to reach the height required in these instructions.
2. Use one of the following support/radiation shields:
IF06RRF rafter radiation shield OR
IF061SR intermediate support radiation shield OR
IF06CFRS ceiling/firestop radiation shield.
3. (1) IF06RF17 roof flashing with storm collar.
4. (1) IF06RCSA cap with spark arrestor.
5. Sections of Pro Vent chimney connector to reach from stove flue collar to chimney.

METAL FAB TEMP/GUARD CHIMNEY COMPONENTS (FOR USA ONLY)

1. Sections of TGS or TGG chimney to reach the height required in these instructions.
2. TGCSP ceiling support
3. TGF flashing
4. TGRSH radiation shield
5. TGIS insulation shield
6. TGSC storm collar
7. TGC cap/spark arrestor
8. Sections of (DWB) double wall or (SW) single wall connector pipe to reach from stove flue collar to chimney.

CAUTION

AVOID SPINNING THE DOOR HANDLE COMPLETELY AROUND EXCEPT WHEN ADJUSTING THE FIT OF THE DOOR. THIS WILL CAUSE THE DOOR TO GO OUT OF ADJUSTMENT.

WARNING

DO NOT ATTEMPT TO OPERATE THIS WOODSTOVE WITHOUT READING AND UNDERSTANDING THESE OPERATING INSTRUCTIONS THOROUGHLY. FAILURE TO OPERATE THIS APPLIANCE PROPERLY MAY CAUSE A SERIOUS HOUSE FIRE.

PRE-USE CHECK

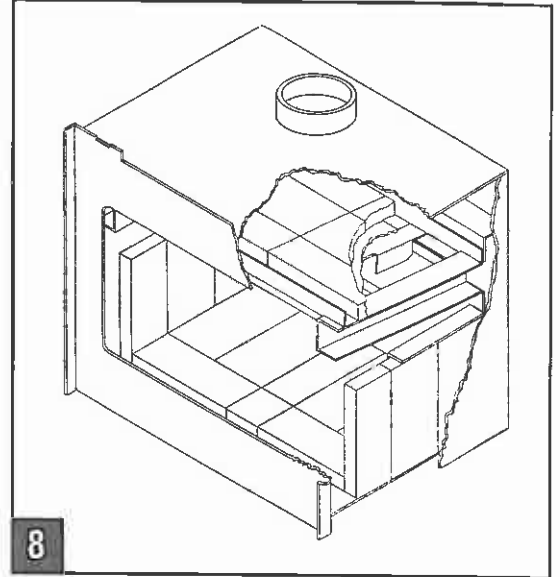
Use the following checklist as a guide to be sure your installation is correct and complete.



- All of the safety warnings have been read and followed.
- Floor protection requirements have been followed.
- Chimney connector is properly installed.
- The proper clearances from the stove and chimney to combustible material have been met.
- The masonry chimney is inspected and clean or the factory built metal chimney is installed according to the manufacturer's instructions and clearances.
- The chimney meets the required minimum height.

FIREBRICK PLACEMENT

Figure 8 below shows the proper positioning of the firebrick. Make sure they are in position before operating the unit. When properly positioned, there should not be any gaps between the bricks.



LATCH ADJUSTMENT

The fuel loading door has been factory adjusted for proper fit. However, if the door seems loose, open the door and rotate the handle one complete turn counter-clockwise. This will adjust the door handle approximately 1/16". If necessary, repeat the adjustment one complete turn at a time, until the handle locks securely into the safety latch and the door fits tightly.

Wood Fuel

Hardwood vs. Softwood

Your woodstove's performance depends a great deal on the quality of the firewood you use. Contrary to popular belief, one species of wood varies very little to the other in terms of energy content. All seasoned wood, regardless of species, contains about 8,000 BTU's per pound. The important factor is that hardwoods have a greater density than softwoods. Therefore, a piece of hardwood will contain about 60% more BTU's than an equal size piece of softwood. Since firewood is commonly sold by the cord (128 cu. ft.), a volume measurement, a cord of seasoned oak (hardwood) would contain about 60% more potential energy than a cord of seasoned pine (softwood).

There are many definitions of hardwood and softwood. Although not true in every case, one of the most reliable is to classify them as coniferous or deciduous.

Softwoods are considered coniferous. These are trees with needle-like leaves that stay green all year and carry their seeds exposed in a cone. Examples of softwood trees are Douglas fir, pine, spruce and cedar.

Softwoods, being more porous, require less time to dry, burn faster and are easier to ignite than hardwoods.

Deciduous trees are broadleaf trees that lose their leaves in the fall. Their seeds are usually found within a protective pod or enclosure. Hardwoods fall into this category. Some examples of deciduous trees are oak, maple, apple, and birch. However it should be noted that there are some deciduous trees that are definitely not considered hardwoods such as poplar, aspen and alder. Hardwoods require more time to season, burn slower and are usually harder to ignite than softwoods.

Obviously, you will use the type of wood that is most readily available in your area. However, if at all possible the best arrangement is to have a mix of softwood and hardwood. This way you can use the softwood for starting the fire giving off quick heat to bring the appliance up to operating temperature. Then add the hardwood for slow, even heat and longer burn time.

Moisture Content

Regardless of which species of wood you burn, the single most important factor that effects the way your stove operates is the amount of moisture in the wood. The majority of the problems woodstove

and fireplace insert owners experience are caused by trying to burn wet, unseasoned wood.

Freshly cut wood can be as much water as it is wood, having a moisture content of around 50%. Imagine a wooden bucket that weighs about 8 pounds. Fill it with a gallon of water, put it in the firebox and try to burn it. This sounds ridiculous but that is exactly what you are doing if you burn unseasoned wood.

Seasoning

Seasoned firewood is nothing more than wood that is cut to size, split and air dried to a moisture content of around 20%. The time it takes to season wood varies from around nine months for softwoods to as long as eighteen months for hardwoods. The key to seasoning wood is to be sure it has been split, exposing the wet interior and increasing the surface area of each piece. A tree that was cut down a year ago and not split, is likely to have almost as high a moisture content now as it did when it was cut.

The following guideline will ensure properly seasoned wood:

1. Stack the wood to allow air to circulate freely around and through the wood pile.
2. Elevate the woodpile off the ground to allow air circulation underneath.
3. The smaller the pieces, the faster the drying process. Any piece over six inches in diameter should be split.
4. Cover the top of the woodpile for protection from rain and snow. Avoid covering the sides and ends completely. Doing so may trap moisture from the ground and impede air circulation.

The problems with burning wet, unseasoned wood are twofold. First, you will receive less heat output from wet wood because it requires energy in the form of heat to evaporate the water trapped inside. This is wasted energy that should be used for heating your home. Secondly, this moisture evaporates in the form of steam which has a cooling effect in your firebox and chimney system. When combined with tar and other organic vapors from burning wood it will form creosote which condenses in the relatively cool firebox and chimney. See the maintenance section of this manual for more information regarding creosote formation and need for removal.

⚠ NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR 'FRESHEN UP' A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER.

WARNING
⚠ BURNING WET UNSEASONED WOOD CAN CAUSE EXCESSIVE CREOSOTE ACCUMULATION. WHEN IGNITED IT CAN CAUSE A CHIMNEY FIRE THAT MAY RESULT IN A SERIOUS HOUSE FIRE.

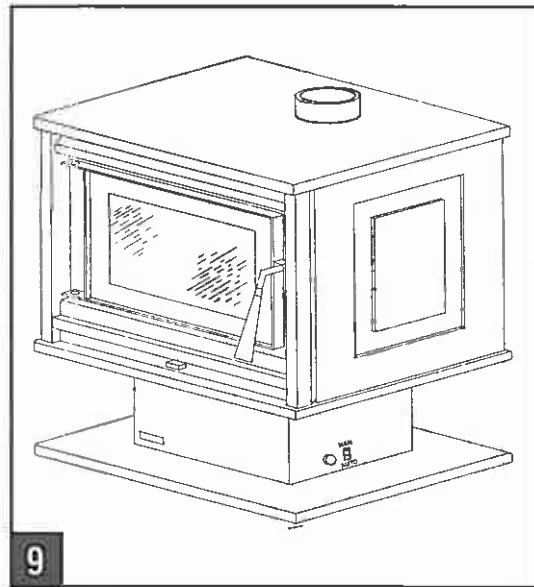
OPERATING INSTRUCTIONS

General Information

The ARROW® Model 1890 woodstove is an efficient woodburning appliance designed to burn natural, seasoned wood. Do not burn artificial logs or driftwood.

A manual temperature setting control located on the front of the stove regulates the amount of combustion air available to the fire, thus controlling the rate of burn. Moving the control lever all the way right (HI) opens the air intake. Moving it left (LO) closes it. The more combustion air allowed into the firebox, the hotter and faster the fire will burn. Closing the air intake slows the rate of combustion resulting in a slower burning fire. Experience with your stove, the quality of your firewood and local conditions will determine the proper setting for maintaining the heat output that best suits your needs.

The Model 1890 comes standard with a 3 speed, 465 CFM convection blower. The blower is equipped with a thermostat to operate automatically or can be operated manually with the AUTO/MAN switch. The rotary knob controls the speed of the blower. (See Figure 9)



Break-In Period

Build your first few fires small to allow the high temperature paint on your stove to cure. During this period excessive temperatures may damage the paint. Allow adequate ventilation to dissipate smoke and odor that may come from the paint during curing. See the accompanying pamphlet "About Curing Your Stove Paint..." for complete paint curing instructions.

Starting the Fire

NOTE: Failure to follow instructions listed may effect the performance of the appliance. During startup and re-fueling it is necessary that the appliance reach operating temperature. For proper performance, wait 30 minutes before turning on the blower.

1. Place several crumpled newspaper pages on the firebox floor.
2. Cover the paper with several pieces of kindling. The kindling should be less than 1" in diameter, well seasoned, dry, split firewood.
3. Move the temperature setting control lever all the way to the front (HI) to open the air intake.
4. Light the newspaper in several places, starting at the back of the firebox and working towards the front.

NOTE: If the chimney flue is cold due to low outside temperatures, several pieces of crumpled paper on top of the fuel can help establish a draft in the flue.

5. Close the door to prevent smoke spillage but do not latch. This allows extra air into the firebox for start-up while preheating the glass to help keep it cleaner.
6. Once the kindling is burning, place three or four small pieces of firewood, two or three inches in diameter on the fire, close the door and latch.
7. Maintain the fire by adding small pieces of firewood periodically until a uniform fire bed has been established.
8. After establishing the fire bed, and the small firewood is burning briskly, add a minimum of three average sized pieces of split firewood, place the wood in such a manner to allow combustion air and flames between them.
9. The blower should not come on for approximately 40 minutes in the AUTO mode. If operating in the MANUAL mode, do not turn the blower on for at least 30 minutes for proper performance.
10. After about 45 minutes to 1 hour the stove will have reached operating temperature. You may slow down the burn rate by pulling the temperature setting lever out to the desired setting.

Re-Fueling

When adding fresh wood to an existing fire:

1. Open the air intake by moving the control lever all the way forward.
2. Wait a few seconds, then open the door slowly.

If the fire has been allowed to die down between re-fueling, it may be necessary to use smaller pieces of wood to re-kindle it. Leave the temperature setting on HI after re-fueling for 10 to 20 minutes to re-establish a moderately high firing rate and bring the appliance back up to operating temperature.

Operating Efficiency

Rather than burning the stove hot and not running the blower, it is more efficient to adjust the damper down and use the blower to move air across firebox surfaces. This method of operation will conserve fuel and gain a maximum amount of heat from the stove. The ARROW® Model 1890 woodburning stove is designed to be an exceptional value in heating efficiency when installed, operated and maintained in accordance with the information in this manual. However, factors unique to your location, installation, or firewood can affect or alter the performance of this appliance. If you experience difficulty lighting the fire or sporadic burning refer to flue draft section on page 13 of this manual.

⚠ WARNING

DO NOT USE ARTIFICIAL LOGS THAT CONTAIN WAX, PARAFFIN, OR OTHER INGREDIENTS THAT CAN RELEASE VOLATILE GASES WHICH MAY CONDENSE ON THE INSIDE OF THE FIREBOX AND CHIMNEY. SOME ARTIFICIAL LOGS CONTAIN FLAMMABLE LIQUIDS THAT MAY CAUSE AN UNCONTROLLABLE FIRE.

⚠ WARNING

ALWAYS OPERATE THIS APPLIANCE WITH THE DOOR CLOSED AND LATCHED EXCEPT DURING START-UP AND RE-FUELING.

CAUTION

DO NOT STORE FUEL WITHIN THE CLEARANCES TO COMBUSTIBLES MENTIONED ON PAGE 2, OR IN THE SPACE REQUIRED FOR REFUELING AND ASH REMOVAL.

ALWAYS OPEN THE DOOR SLOWLY WHILE THE FIRE IS BURNING TO AVOID SMOKE AND FLAME SPILLAGE. IT IS BEST TO UNLATCH THE DOOR, WAIT A FEW SECONDS, THEN OPEN THE DOOR SLOWLY. TO INSURE GOOD, RAPID RE-IGNITION, CREATE A VALLEY IN THE COAL BED FROM THE FRONT TO ABOUT IT'S CENTER, WHICH WILL ALLOW COMBUSTION AIR UNDERNEATH THE FRONT PIECE OF FUEL.

⚠ WARNING

DO NOT OVERFIRE THIS HEATER. ATTEMPTS TO ACHIEVE HEAT OUTPUT RATES THAT EXCEED HEATER DESIGN SPECIFICATIONS CAN RESULT IN PERMANENT DAMAGE TO THE HEATER.

WARNING

ASHES SHOULD NEVER BE PLACED IN WOODEN OR PLASTIC CONTAINERS, OR IN PAPER OR PLASTIC BAGS, REGARDLESS OF HOW LONG THE FIRE HAS BEEN OUT. COALS HAVE BEEN FOUND TO STAY HOT FOR SEVERAL DAYS WHEN EMBEDDED IN ASHES.

WARNING

FAILURE TO INSPECT AND CLEAN YOUR CHIMNEY SYSTEM REGULARLY CAN RESULT IN A SERIOUS FIRE WHICH MAY DAMAGE THE CHIMNEY OR CAUSE A HOUSE FIRE.

WARNING

DO NOT OPERATE THIS WOODSTOVE IF THE DOOR GASKET IS MISSING OR DAMAGED. DANGEROUS OVERFIRING MAY OCCUR WHICH CAN DAMAGE THE APPLIANCE OR IGNITE CREOSOTE IN THE CHIMNEY, POSSIBLY CAUSING A HOUSE FIRE. IF ANY PART OF THE WOODSTOVE OR FLUE SYSTEM IS GLOWING THE STOVE IS BEING OVERFIRED.

CAUTION

TAKE CARE WHEN USING OVEN CLEANERS AS THEY MAY BE CAUSTIC. ALWAYS FOLLOW LABEL INSTRUCTIONS AND WARNINGS.

MAINTENANCE INSTRUCTIONS

Ash Disposal

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. The ashes should be retained in the closed container until all cinders have thoroughly cooled.

Creosote & Soot

Formation and need for removal.

When wood is burned slowly, it produces tar and other organic vapors which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a newly started fire or from a slowly burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire which may damage the chimney or even destroy the house.

The chimney connector and chimney should be inspected at least twice monthly during the heating season to determine if a creosote or soot build-up has occurred. If so, it should be removed to reduce the risk of a chimney fire.

To help prevent creosote build-up, always burn dry, well seasoned firewood. When re-fueling after an extended low burn rate, allow the appliance to burn with the combustion air intake fully open (temperature setting on HI) for ten to twenty minutes to burn off creosote deposits that accumulate during the low burn.

Inspect the system at the stove connection and at the chimney top. Cooler surfaces tend to build creosote deposits quicker, so it is important to check the chimney from the top as well as the bottom.

The creosote and soot should be removed with a brush specifically designed for the type of chimney in use. A chimney sweep can perform this service. It is also recommended that before each heating season the entire system be professionally inspected, and cleaned and repaired if necessary.

Door Gasket

Check the door gasket periodically for proper seal. As the door gasket compresses or "seats" during use it will be necessary to adjust or tighten the door latch. See page 10 for information on how to adjust the latch. Wear or damage to the gasket material can cause air leakage into the firebox resulting in overfiring and loss of efficiency.

Replace the gasket when necessary with 5/8" diameter woodstove gasket material available from your local woodstove retailer or order Part # 9038 Firedoor Gasket Kit from your nearest Arrow® dealer. The Firedoor Gasket Kit comes complete with gasket material, high temperature adhesive and instructions.

Door Glass

Inspect the glass regularly for cracks or breaks. If you detect a crack or break, extinguish the fire immediately and contact your Arrow® dealer for replacement.

A portion of the combustion air entering the firebox is deflected down over the inside of the door glass. This air flow "washes" the glass helping to keep smoke from adhering to it's surface.

When operated at a low burn rate less air will be flowing over the glass and the smokey, relatively cool condition of a low fire will cause the glass to become coated. If the deposits on the glass are not very heavy, normal glass cleaners work well.

Heavier deposits may be removed by using a damp cloth dipped in wood ashes or by using a commercially available oven cleaner. After using an oven cleaner, it is advisable to remove any residue with a glass cleaner, or soap and water. Oven cleaner left on during the next firing can permanently stain the glass and damage the finish on plated metal surfaces.

Do not clean the glass with materials that may scratch or otherwise damage the glass. Scratches on the glass can develop into cracks or breaks. Never attempt to clean the glass while a fire is in the unit.

The best way to keep the glass clean is to operate the stove efficiently by using dry well seasoned wood and burning moderate to hot fires

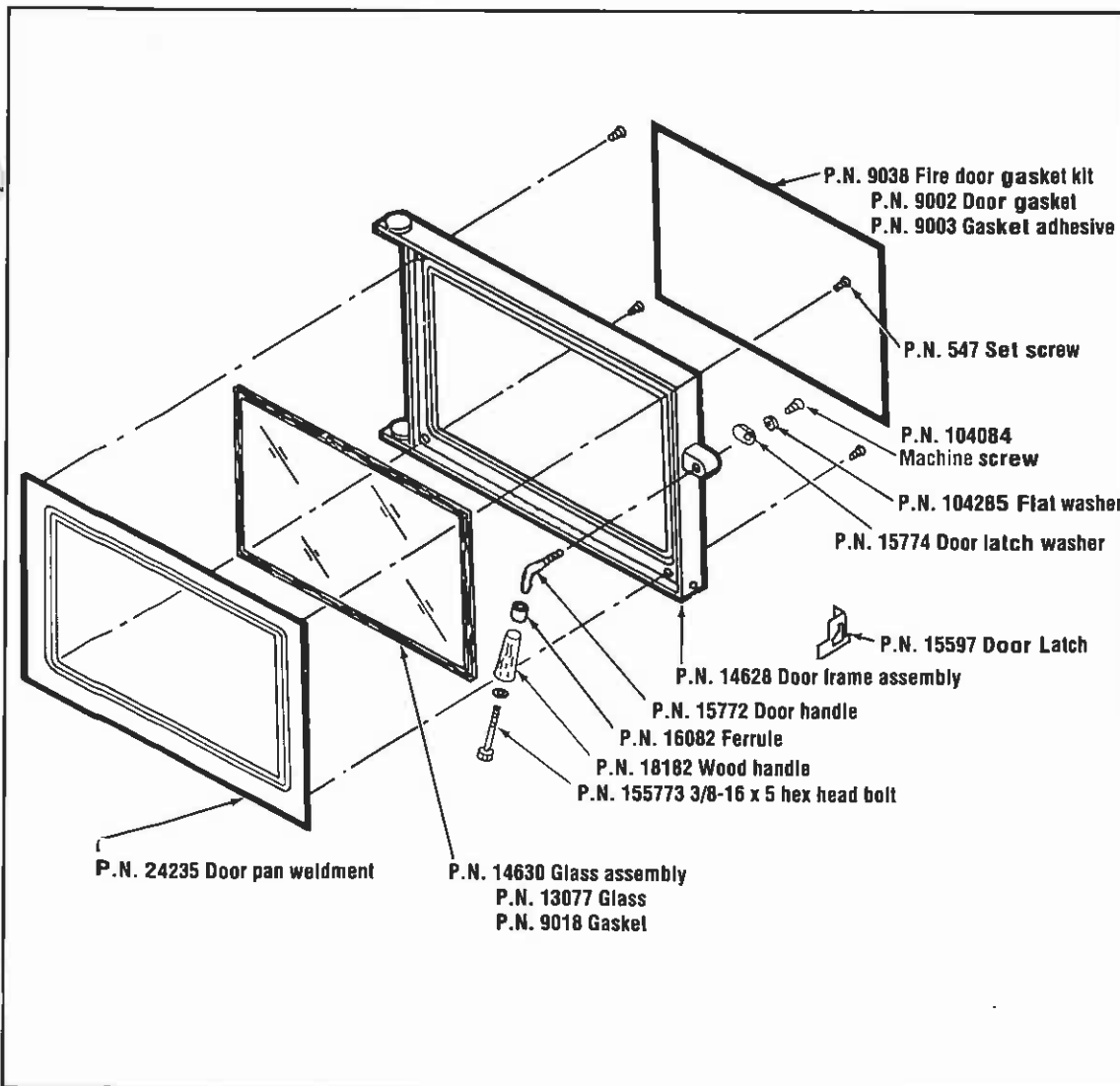
Installation of Replacement Glass

1. Make certain fire is out and appliance is cool to the touch.
2. Remove door from appliance.
3. Lay door face down on table or counter with door handle hanging off edge of table so door lays flat. Protect table so neither the table nor door will be scratched.
4. Gently push door gasket material back from each corner of the door to expose the heads of four small Allen screws in each extreme corner of the door gasket channel.
5. Use 1/8 inch Allen wrench to remove the four Allen screws.
6. Reach under door to hold the loose door front panel in place. While holding panel firmly in place with finger tips, turn door over so it is now flat on its back side.
7. Lift front panel off door, exposing glass and glass gasket. Remove the glass.
8. Use only Neoceram Glass, Part No. 14630.
9. Position the glass with it's edges evenly overlaping the opening in the front door pan.
10. Replace 4 Allen screws. Squeeze each corner of door panel up into corner of door as you use the Allen wrench to start the Allen screws into the front panel threads. Be careful not to cross thread the screws.
11. Tighten each corner just a few turns until each corner is secured. Then continue to tighten alternately each corner a few turns at a time until the front panel is tightened snugly. Now tighten each corner firmly, but do not over tighten.
12. Push door gasket back into place over heads of Allen screws.
13. Replace door on appliance.

WARNING

DO NOT OPERATE THE WOODSTOVE IF THE DOOR GLASS IS BROKEN OR MISSING. DANGEROUS OVERFIRING CAN OCCUR WHICH CAN DAMAGE THE APPLIANCE OR IGNITE CREOSOTE IN THE CHIMNEY, POSSIBLY CAUSING A HOUSE FIRE.

GLASS DOOR REPLACEMENT PARTS



Optional Accessories

Outside Air/Mobile Home Kit
AK90

Column Trim Kit
TR8

Side Trim for Heat Shields
18022

Gold Coated Door Trim
24016

FLUE DRAFT

Like all modern woodburning appliances, the Model 1890 requires the proper amount of flue draft to assure safe and efficient operation. Flue draft is measured as negative pressure in the chimney. The amount of negative pressure determines how strong the draft is. The draft is important because it draws the combustion air into the firebox and pulls the smoke out of the chimney.

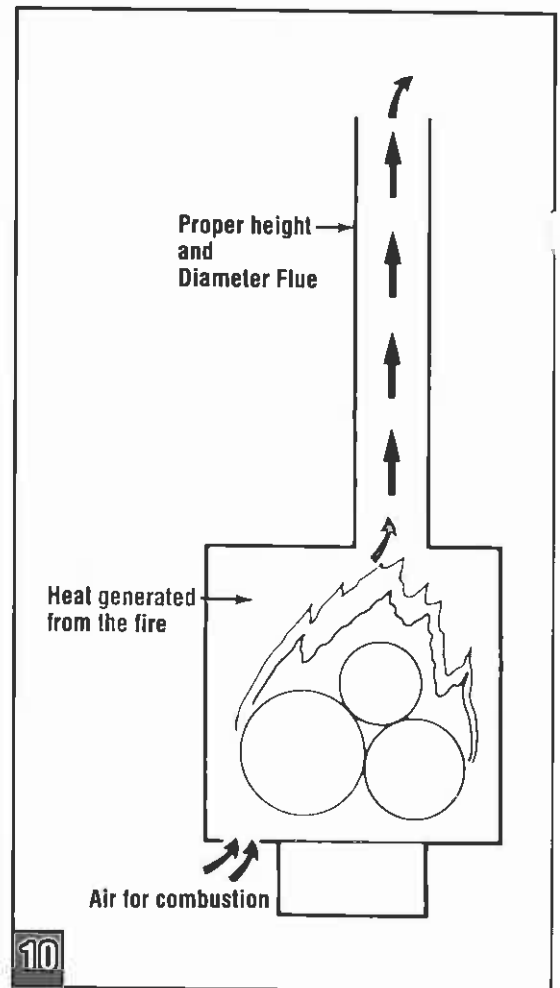
There are three basic criteria essential in establishing and maintaining flue draft:

1. Availability of combustion air
2. Heat generated from the fire
3. Diameter and height of the flue system

These three factors work together as a system to create the flue draft. Increasing or decreasing any one of them will effect the other two and thus change the amount of draft in the entire system. (Figure 10)

- 1. Availability of combustion air.** A source of air (oxygen) is required in order for combustion to take place. The air enters the firebox through an opening in the stove body. The amount of air allowed in is regulated by the draft slide control. The important thing is to realize that whatever air is consumed by the fire must be replaced. If you are using room air, the air is replaced through cracks around windows, under doors, etc. However, most newly constructed houses or existing homes fitted with tightly sealed doors and windows are relatively air tight. In this case, an outside air source must be made available to feed combustion air from outside the home into the stove.
- 2. Heat generated from the fire.** Most of the heat produced from the fire is transferred into the heat exchanger of the stove, then into the room. However, part of this heat escapes up the chimney taking smoke and other combustion gases with it. Most modern woodburning appliances including the Model 1890 extract heat so efficiently that the amount that goes up the flue can be minimal. This is one reason why it is important to burn well seasoned wood. The heat generated from the fire should be warming your home and establishing the flue draft. It should not be wasted by evaporating moisture out of wet, unseasoned wood.

- 3. Diameter and height of flue system.** The inside diameter of the flue system should be the same size as the flue outlet collar on the stove (for the Model 1890 it is 6".) The height of the chimney should be at least 12 feet from the top of the stove and extend above the roof in accordance with the installation instructions on page 5. A specific volume of air, determined by the diameter and height of the chimney connector and chimney, is contained within the flue system. As heat from the fire enters the flue, it warms this air causing it to rise. The air moving up the flue draws smoke and more heated air from the fire with it, thus establishing draft. The amount of draft depends on the temperature of the heated air and the volume of air that is contained in the flue system.



Draft Problems

For the Model 1890, the flue draft needs to be between .04 and .10 inches of water column as measured with a draft meter. Most woodstove dealers have draft meters available to measure your flue draft if you suspect a problem.

If your fire has a tendency to always burn fast and hot regardless of how you adjust the temperature control then your flue draft is probably too high. If so, decrease the volume of air in the flue system by decreasing the height of your chimney or install a damper into the first section of chimney connector above the stove. The damper can be adjusted until you can control the rate of burn with the temperature control on the front of the stove.

However, a much more common problem is when the flue draft is too low. If the fire is hard to start and smoke spills out of the door, or you find it difficult to establish and maintain a moderately high burn rate, then the flue draft is too low and corrective measures must be taken.

Be sure you have air available for combustion and that your firewood is dry and well seasoned. Build your fires properly and according to the instructions given on page 14. Be sure your flue system is installed correctly and that it is the proper diameter and height. In addition, check for the following:

- All chimney connector sections are properly installed and the joints are sealed tightly.
- The chimney and chimney connectors are clean; free of creosote build-up.
- If utilizing an existing chimney that has been left unused over a period of time, be sure it is not obstructed with debris from animals or nesting birds.
- If using an existing masonry chimney, the chimney connector should pass through the wall of the flue lining but not extend into the flue itself. If the masonry chimney has a clean-out door, be sure it is closed and tightly sealed.
- Make sure overhanging trees and branches are cut back within 10 feet of the top of the chimney.
- If the chimney cap is equipped with a spark arrestor or screen, be sure it is clean and free of any build-up of soot or creosote.

If you still suspect you have a low draft problem it may be necessary to increase the volume of air in your flue system. Since the diameter of your flue

system is matched with the size of the flue collar and should not be changed, then the height of the system will need to be increased. Add chimney a little at a time until the draft improves.

In some cases, regardless of what you do, it can still be difficult to establish the proper flue draft. This is especially evident when using an exterior factory-built chimney or exterior masonry chimney which is likely to have too large of a flue. Try placing several sheets of crumpled paper on top of your kindling as close to the flue outlet of the stove as possible. Light this paper first then the paper under the kindling. The heat generated from the rapidly burning paper on top of the kindling should help get the draft established.

Still other factors can effect how well your flue system performs. Neighboring structures, high winds, tall trees, even hillsides can effect air currents around the chimney. Well designed chimney caps, wind directional caps, even draft inducing caps are available that can help. Your woodstove dealer is the local expert in your area. He can usually make suggestions or discover problems that can be easily corrected allowing your woodstove and flue systems to operate correctly as it has been designed, providing safe and economical heat for your home.

⚠ DO NOT OPERATE THIS UNIT IF THE DOOR GASKET IS MISSING OR DAMAGED. DANGEROUS OVERFIRING MAY OCCUR WHICH CAN DAMAGE THE UNIT OR POSSIBLY CAUSE A FIRE HAZARD. IF ANY PART OF THE UNIT OR FLUE SYSTEM IS GLOWING, THE STOVE IS BEING OVERFIRED.

BUILD THE FIRE DIRECTLY ON THE FIREBRICK FLOOR. DO NOT USE A GRATE OR OTHERWISE ELEVATE THE FIRE WHEN BURNING WOOD.

⚠ WARNING
NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR 'FRESHEN UP' A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER.

⚠ WARNING
DO NOT LEAVE THE FIRE UNATTENDED WHEN THE DOOR IS UNLATCHED. CARELESSLY PLACED FIREWOOD COULD FALL OUT OF THE FIREBOX CREATING A FIRE HAZARD.

LIMITED WARRANTY

DESIGNATION OF WARRANTOR. This limited warranty is extended by Heatilator Inc., Division, HON INDUSTRIES, (hereinafter referred to as Heatilator), with respect to ARROW® woodstoves and fireplace inserts (hereinafter referred to as stoves) as described herein, while in the possession of the original consumer purchaser.

PRODUCT. This ARROW® stove is comprised of the stove proper, blower assembly, speed control switch, and door seal. Except where specifically excluded from coverage hereunder, this Limited Warranty covers all of the components designated. See EXCLUSIONS AND QUALIFICATIONS below for further information on product coverage.

WARRANTY. This ARROW® stove proper is warranted to be free of defects in material and workmanship for a period of five (5) years. The blower assembly, speed control switch and door seal are warranted to be free of defects in material and workmanship for a period of one (1) year.

WHAT HEATILATOR WILL DO IN THE EVENT OF A DEFECT. If this ARROW® stove is found to be defective in material or workmanship (see Heatilator's right of investigation outlined below), Heatilator will repair or replace such defects in the ARROW® stove at Heatilator's option, according to the following schedule:

- (1) During the first year of the Limited Warranty, Heatilator will repair or replace the defective component at no charge and also will pay for reasonable labor costs for repair work.
- (2) During the second through fifth years of the Limited Warranty, Heatilator will repair or replace the steel components of the stove proper, excluding all freight and labor expenses.

EXCLUSIONS AND QUALIFICATIONS.

This Limited Warranty is subject to the following exclusions and qualifications:

- (1) This Limited Warranty does not apply to, and Heatilator assumes no responsibility for, any damages that result due to installation or operation not in accordance with both the Installation Instructions and Operating Instructions furnished with the unit.
- (2) This Limited Warranty does not apply to any stove which has been modified or damaged in shipping or by improper handling, improper operation, abuse, misuse, accident or unworkmanlike repairs.
- (3) This Limited Warranty does not cover the glass in the glass door, surface finish of the stove, hearth pad, decorative trim, or catalytic combustor (where applicable).
- (4) This Limited Warranty extends only to the original consumer purchaser. Proof of purchase must accompany warranty requests.
- (5) Heatilator does not warrant the structural performance of the stove when fuel products with abnormal burning characteristics, including, but not limited to, synthetic logs, wood treated with flammable liquid, logs made from pressed wood, driftwood or any material containing salts or corrosives, flammable liquids, trash or garbage are used. Fuel products with abnormal burning characteristics can cause build-up affecting the operation of the stove. Flammable liquid fuels are explosive and never should be used in this product.
- (6) Heatilator expressly excludes any liability hereunder for defects or damage caused by the installation or use of any components not expressly authorized and approved by Heatilator. Heatilator further assumes no liability for defects or damage caused by any modification not expressly authorized and approved by Heatilator. Unauthorized components or modifications could create a fire hazard by altering the safety design of the stove.
- (7) Labor costs to be borne by Heatilator pursuant to this Limited Warranty must be approved by Heatilator and must not exceed the retail price of the replacement parts.

LIMITATION OF LIABILITY.

IT IS EXPRESSLY AGREED AND UNDERSTOOD THAT HEATILATOR'S OBLIGATION AND PURCHASER'S EXCLUSIVE REMEDY UNDER THIS WARRANTY, UNDER ANY OTHER WARRANTY EXPRESS OR IMPLIED (INCLUDING MERCHANTABILITY), OR OTHERWISE, SHALL BE LIMITED TO REPLACEMENT OR REPAIR OF ONLY ARROW® BRAND COMPONENTS AS ABOVE SPECIFIED.

THE DURATION OF ANY IMPLIED WARRANTY, INCLUDING MERCHANTABILITY, APPLICABLE TO THIS ARROW® STOVE IS LIMITED TO THE DURATION OF THE FOREGOING WARRANTY. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

IN NO EVENT SHALL HEATILATOR BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES CAUSED BY DEFECTS IN THE ARROW® STOVE. WHETHER SUCH DAMAGE OCCURS OR IS DISCOVERED BEFORE OR AFTER REPLACEMENT OR REPAIR, AND WHETHER OR NOT SUCH DAMAGE IS CAUSED BY HEATILATOR'S NEGLIGENCE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

BUILDING CODES. Since building code requirements vary greatly throughout the United States and Canada, users of this stove should determine in advance whether there are any building code restrictions on the installation or use of this stove. Heatilator makes no representation or warranty regarding building code compliance and shall not be responsible for compliance therewith.

HEATILATOR NOT RESPONSIBLE FOR WORK DONE WITHOUT WRITTEN CONSENT.

Heatilator shall in no event be responsible for any warranty work done without first obtaining Heatilator's written consent.

DEALERS HAVE NO AUTHORITY TO ALTER THIS WARRANTY. Heatilator's employees and dealers have no authority to make any warranty nor authorize any remedies in addition to or inconsistent with those stated above.

OTHER RIGHTS. This Warranty gives you specific legal rights. You may also have other rights which vary from state to state.

HOW TO REGISTER A CLAIM AGAINST

WARRANTY. In order for any claim under this Limited Warranty to be valid, Heatilator must be notified of the claimed defect in writing to Heatilator Inc., Customer Relations Department, 1915 West Saunders Street, Mt. Pleasant, IA 52641. Heatilator reserves the right to investigate any and all claims against this Warranty.

HEATILATOR® and ARROW® are the registered trademarks of Heatilator Inc.

Attention

**WOODSTOVE
INSTALLER**

***Please return these
Operating & Installation
Instructions to the
Firebox
for Consumer Use***

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