

# SURDIAC



## 515/715 COAL & WOOD STOVES

### INSTALLATION & OPERATING INSTRUCTIONS

SAFETY NOTICE: IF THIS SURDIAC STOVE IS NOT PROPERLY INSTALLED, A HOUSE FIRE MAY RESULT. FOR YOUR SAFETY, FOLLOW THE INSTALLATION DIRECTIONS. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

# 1. General Information

The Surdiac 515/715 coal and woodstoves are made of steel and cast iron. They incorporate the expertise gathered from over 100 years of stove manufacturing. Features such as the coal hopper, enameled heat exchanger, and thermostat have been refined over the years to obtain maximum fuel efficiency and years of trouble-free operation.

To obtain the maximum benefits from your new stove and keep your family safe, as well as warm, READ THIS ENTIRE MANUAL CAREFULLY BEFORE INSTALLING YOUR STOVE. FAILURE TO DO SO MAY RESULT IN DAMAGE TO PERSONS AND PROPERTY.

When installing, operating, and maintaining your Surdiac stove, follow the guidelines given in these instructions. Save these instructions and keep them so that they are always available to anyone using the stove.

Several areas of the country require a building permit to install a solid fuel burning appliance. The National Fire Protection Association's Code 211 or similar regulations may apply to the installation of solid fuel burning appliances in your area. Your dealer has been specially selected for his knowledge of your local codes and can provide assistance in making sure your installation is safe and legal. You may also contact your insurance representative, building, or fire officials to determine what regulations apply in your area.

## 2. Hazards Connected to the Use of the Surdiac 515/715

Any use of fire in the house represents a certain danger and with intense overfiring, temperatures on the surface of the Surdiac stove can exceed 1000° F (536° C).

Please comply with the following warnings.

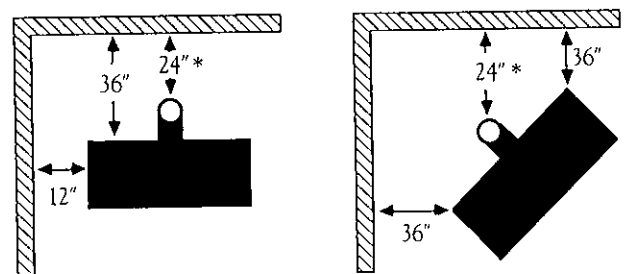
- Never overfire the stove. If any part of it glows, you are overfiring, and serious damage to the stove or a chimney fire could result.
- Never modify your Surdiac stove in any way which is not in accordance with the manufacturer's specifications.
- Never operate your Surdiac stove with the doors open, except for normal tending of the fire.
- Teach children that the stove is hot and should not be touched.
- Never burn trash of any kind in the stove.
- Do not dry clothes over the stove, they could fall and ignite.
- Keep loose flammable materials at least 48 inches away from the stove.
- Never use the stove if there are combustible gases in the house. A few examples of combustible gases are the fumes from certain cleaning fluids, adhesives, and paints.

- Always wear protective gloves when adding fuel to the fire and riddling the ash.
- Allow the poker to cool in a safe place after riddling the ash.
- Use only premium grade anthracite coal or seasoned wood in your Surdiac stove. Never use synthetic logs or fireplace coal.
- 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 while it is in use.
- Never operate your Surdiac stove with cracked or broken glass. Replace damaged glass with ceramic glass 4mm in thickness (available from your dealer).
- Avoid creating a low pressure condition in the room where the insert is operating. Operating an exhaust fan or a clothes dryer could create a low pressure area, causing poisonous gases to come out of the stove into the room.
- Do not use andirons in this stove.
- This stove is not approved for use in mobile homes.

## 3. Installation

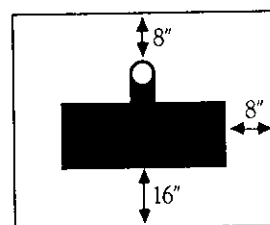
For your safety, follow these instructions. Consult local building or fire officials about restrictions and installation inspection in your area. If the stove is not properly installed, a house fire may result. Refer to the chimney and chimney connector manufacturer's instructions and local building codes for installation through combustible walls or ceilings.

Install with minimum clearance to walls as shown.



Clearance to Combustible Wall    Corner installation

\*Pipe clearance is 24" to combustibles.



Floor protection

Figure 2: Clearance to Combustibles

## Location

You can install your Surdiac stove in a variety of locations in your home, but you must protect combustible materials in the vicinity of the stove from heat. Figure 2 shows the minimum clearances to combustibles that must be maintained when installing the stove.

## Floor Protection

The combustible floor protector should be  $\frac{3}{8}$ " mineral board over 24 gauge sheet metal or its equivalent, and should extend 8" beyond either side of the stove and 16" in front of the stove. In addition, the floor protection behind the stove should extend 8" beyond the stove pipe if it is vented to the ceiling, and 2" to either side of the pipe when vented to a wall.

## Wall Protection

The minimum distances from combustible walls for the Surdiac stoves are 12" from the sides and 36" from the rear. The stove pipe chimney connector must be at least 24" from combustibles.

## The Chimney and Its Connection

The Surdiac 715 must be connected to a tile-lined masonry chimney for residential type appliances, or an Underwriter's Laboratories, Inc. listed building heating appliance chimney, 6" in diameter. An existing masonry chimney should be inspected and, if necessary, repaired by a competent mason. Chimneys with openings measuring larger than 8" x 8" should be lined with 6" diameter stainless steel pipe, series 300 or 400. The chimney should be of a suitable height (approximately 15 ft.) to provide an operating draft in the range of .03 to .05 inches W.C. DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

The chimney connector, or pipe, which is used to connect the stove to the chimney, should be 24 gauge blue steel, its equivalent or better. Each joint of the pipe should be sealed with furnace cement and secured with three sheet metal screws per joint. Horizontal pipe runs should have 1" of rise per foot of run. Optimum draft performance can be obtained by installing a barometric damper set at .035 inches W.C.

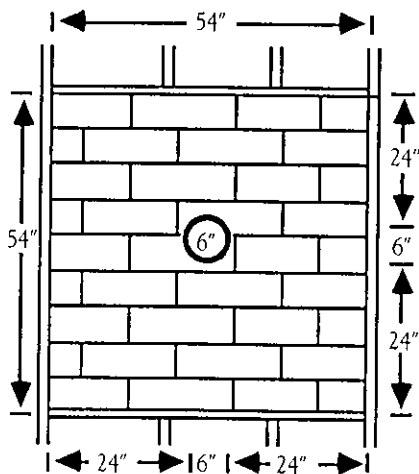


Figure 3: Clearance to Combustible Wall

## Connection to a Masonry Chimney

The point where a stove connector penetrates a combustible wall to connect to a masonry flue is the most likely place for a fire to occur. The chimney connector for the Surdiac has a 24" clearance to combustibles. At a combustible wall with a six inch inside diameter thimble, a solid masonry wall needs to be provided which measures 54" x 54" (see Figure 3). This will provide the prop-

er clearance when a six inch thimble is located in the center of this wall. The thimble should be permanently cemented in place with high temperature refractory cement and extend through the chimney wall to the inner face of the liner, but not beyond. If possible, the stove pipe should extend into the thimble so that the end of the stovepipe is flush with the inner end of the thimble. The chimney connector shall not pass through any floor, wall, or ceiling, nor through a fire wall partition. Other safe methods of passing a connector through a wall are available. If you have any doubts about the safety or type of chimney connection, consult either your dealer, local building inspector, or fire official.

## 4. Operation

BEFORE BUILDING A FIRE PLEASE READ THE FOLLOWING SECTION CAREFULLY. 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 WHILE IT IS IN USE.

### Fuel

Use only seasoned wood or premium grade anthracite pea-sized coal for fuel. Premium grade anthracite usually has approximately 8% to 10% ash content, a fixed carbon content of approximately 86% to 88%, and approximately 4% volatile combustible matter. The best type of anthracite would be one with a higher volatile combustible matter percentage coupled with a reduction of ash content with at least an 86% fixed carbon content.

The ash fusion point (the temperature at which "clinkers" are formed because of coal ash being fused) of a high grade of anthracite will be in the area of 2,800°F to 3,000°F, and the BTU output should be approximately 13,500 to 14,500 BTU's per pound.

If larger CHESTNUT or smaller BUCKWHEAT coal is used, a negative change in stove performance can be expected.

Chestnut-sized coal will give you a hotter fire and a noticeable decrease in unattended burn time. (The faster your coal burns, the more often you need to shake down ashes due to accelerated ash buildup.)

It is a normal misconception that larger size coal produces more heat as compared to an equal volume of smaller caliber coal. A load of chestnut-sized coal will burn hotter only because there is more fuel being consumed at a faster than normal rate. This is primarily due to the increased air spaces or pockets that are created by the larger chunks of coal as they stack up on the grate of your stove, thus encouraging faster than normal airflow and combustion. The BTU output of a pound of chestnut-sized coal is the same as a pound of pea-sized coal of equal quality.

### Wood and Coal Storage

When storing wood outside, it should be covered from the elements and stored off the ground. Make certain that the woodpile has good air circulation through it in order to promote drying to aid in the seasoning process.

To obtain the most benefit from the wood you burn, use only seasoned wood which has been cut and split for at least one year. Burning unseasoned or wet wood causes the rapid development of creosote, while reducing the heat value of the wood being burned.

When coal is stored outside, it should also be covered from the elements. If the coal is wet and the temperature drops, it can freeze into a solid mass. Pieces of ice could become mixed with coal and possibly damage the stove.

## Creosote and Soot Formation and the Need for Removal

When wood or coal is burned slowly they produce tar and other organic vapors which combine with expelled moisture and unburned particles to form creosote or soot. These materials can condense in the relatively cool chimney flue of a slow-burning fire. The creosote or soot that accumulates in the flue is highly flammable and is the fuel of chimney fires. This material needs to be removed by sweeping the chimney flue and connector. The frequency of sweeping will depend on how you operate your stove and your fuel, but it is important to inspect the flue after every two weeks of use. An accumulation of 1/4" or more on the sides of the flue or connector is considered hazardous and should be removed.

In the event that creosote in your chimney or flue connector ignites, the resulting fire is often accompanied by a roaring noise and a crackling sound as flakes of burned creosote break loose. If you suspect you are having a chimney fire, immediately close the draft regulator and make sure the door and ash door are closed. Call the fire department.

Trying to extinguish the fire in the stove will not help; in fact, it can make matters worse by allowing oxygen through the door, which then supports the fire in the chimney. When the roaring and crackling has stopped, resist the temptation to open the door and look at the fire. The fire may have suffocated, but could rekindle when you open the door. After a chimney fire, do not use your stove until the chimney and flue connector have been cleaned and inspected to insure that no damage has been sustained.

## Breaking in Your Stove

A cast iron stove should be "broken in" much in the same way a new car with a cast iron engine is: gradually. It is mandatory that five consecutive small coal fires be built in the stove prior to using it continuously with the hopper fully loaded. The five "firings" are successive small coal fires being built with a complete cooling off of the stove after the fire dies down. It is not acceptable to build a small fire and keep it going for 2-3 days on a low stove setting. The stove must be cooled off completely after a firing in order to properly heat treat all the metal parts on the stove.

NOTE: You should never bring the stove from very cold temperatures into your home and build a fire in it immediately. The stove should be allowed to properly warm up to room temperature (50-60° F) before firing it up for the first time.

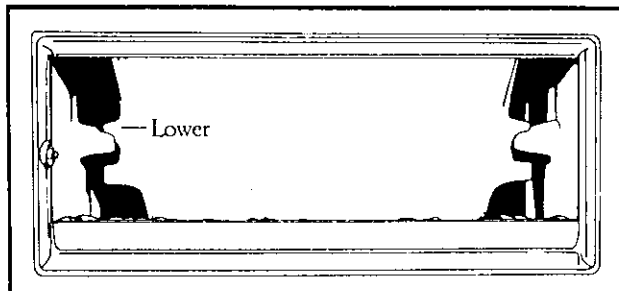
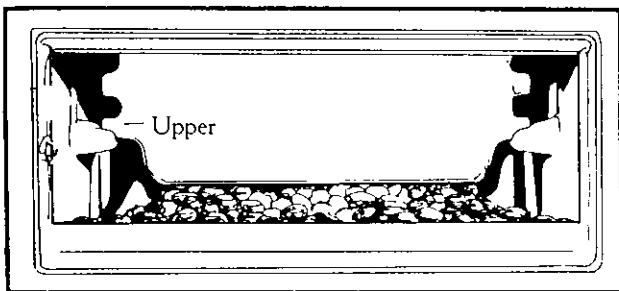


Figure 4: Hopper Levels

## Surdiac 515/715 Hopper Adjustment

The hopper height is adjustable and allows different size fuels to be used. Pea size anthracite is the recommended fuel. The lower hopper position is for pea size anthracite. If pea size anthracite is not available the upper hopper position can be used for nut size anthracite. To adjust the height of the hopper, remove the two coal guide plates (part 11) and firmly grasp the top of the hopper and raise or lower it. Replace the coal chutes.

## Thermostat Adjustment

The thermostat senses changes in the stove operating temperature and opens or closes a valve in the rear of the stove, regulating the amount of air the fire receives. The thermostat dial, on the right hand side of the stove, has been set in the factory and is not to be adjusted except by a qualified technician. Do not force the thermostat dial, turn it only as far as it will naturally go. *When the stove is hot, the dial will not go back to zero.*

The thermostat should be set as follows:

0-1 Mild temperatures or nighttime use

1-2 Normal usage

3-4 Cold weather usage

5-8 High heat setting. *Not to be used for a duration of more than two hours.* After operating in this range for two hours, the stove must be operated at a setting of 3 or less for the next 24 hours.

## Building a Coal Fire

The key to building a coal fire is patience. You must get a good bed of hard wood coals or charcoal established before you add coal and then you have to wait until the first bit of coal is burning well before you add more coal. If in the beginning you have trouble getting a coal fire going it is almost always because the fire was rushed.

Anthracite is difficult to light and if you sprinkle kindling and coal on top of paper and then light it, it will rarely work. The easiest way to get a good bed of wood coals is to use charcoal. If you don't use charcoal, prepare several 3-4 inch chunks of hardwood and let these burn down into coals. It is difficult to get long lasting coals from soft woods like pine.

Open the large glass door, fill the grate area with newspaper and a few pieces of 4" kindling. Cover the paper and kindling with charcoal briquettes.

Before lighting the paper cover the inside of the glass with aluminum foil. This will keep the glass clean until it becomes too warm to allow smoke to condense on it.

Set the thermostat to 8, light the paper and close the door. In about 15 minutes the charcoal should be evenly ashed over and red. Sprinkle a one inch layer of coal evenly over the charcoal with a shovel. When this layer of coal is glowing orange you can add enough coal to bring the fuel bed level with the bottom of the hopper.

For the break-in fires, set the thermostat to 1 and allow the fire to burn out without adding any more coal. This is also the time to remove the aluminum foil.

When the second layer of coal is burning well, the hopper can be filled to within an inch of the top.

When the fire goes out, all of the ash and unburned coal needs to be removed from the grates before starting a new fire. Pull the grate dump rod on the right side of the stove below the thermostat. This separates the grates by several inches and allows you to rake unburned coal into the ash pans.

## Keeping the Fire Burning

Ash that forms around coal as it is burning needs to be physically removed. This will need to be done about every 12 hours on low settings and every 6 hours on medium to high settings.

There are 3 openings above the ash door where the short poker must be inserted in order to shake down the ashes (Figure 5). When you introduce the poker into each opening, use a stabbing motion

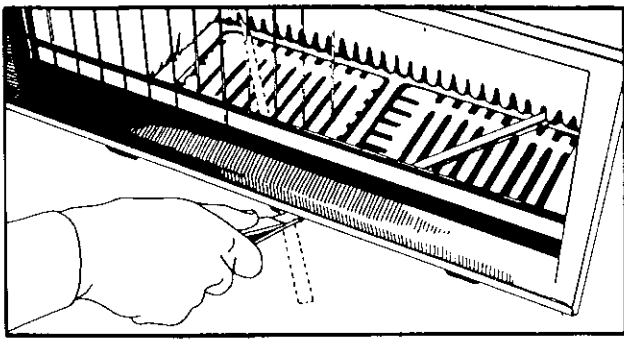


Figure 5: Poker Operation

several times moving to the right, left, and back and front of the firegrate. Do not employ a side-to-side swaying motion when shaking the stove down because it will result in coal and ash buildup along the edges of the fire basket. Open the ash pan door and continue poking until you see small pieces of glowing coal rain through the grate into the ash pan.

**NOTE:** It is important that all ash is removed from the grate area with particular attention to the back side of the hopper area. If the ashes are not thoroughly removed, less space will be available for coal combustion resulting in less heat.

**NOTE:** After extended use of the poker, it will become shorter from wear, making it more difficult to remove ash from the back of the firebox. Inspect the poker yearly, making sure it is at least 15" long (overall length including handle).

After shakedown, the coal hopper should be refilled.

### Important

After removing the poker from each opening, be sure that the opening is closed so that it does not permit a draft of air to enter the firebox area – this would interfere with the operation of the thermostat. A brass hook tool is provided with the stove for the purpose of removing ash or pieces of coal that might get trapped in the poker hole. After shaking down the ashes, use the iron tool provided and remove the ash pans and dispose of the ashes. Ashes should never be allowed to accumulate in the pans between shakedowns. If the ash level builds up to the grate, the grates will burn out.

### 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 the soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

### Building a Wood Fire

Remove the protector plate, the coal guide plates, and the hopper. Return the protector plate to the stove and place it over the opening. This reduces the size of the top firebox opening which prevents smoke from entering the house when you lift the top lid. Place crumbled newspaper, a handful of kindling and a few small pieces of wood on the grates. Set the thermostat at 8, light the paper and close the door. When the wood is burning well, adjust the thermostat back to the desired level.

### Maintaining the Fire

New wood may be added to the fire when the fuel load has been reduced to coals. A few minutes before adding new wood, turn the thermostat to a setting of 5 or more. This will preheat your coals

and clear the combustion chamber of smoke and gases. Whenever you open a door on the stove, whether it be to check on the fire's condition or to add fuel, you should follow this procedure. Under certain conditions, high concentrations of unburned gases could be in the stove, and rapidly opening a door could cause these gases to ignite with explosive force.

After adding the new wood, allow the stove to operate at a high setting for 15 to 20 minutes before resetting the thermostat. A short, hot fire immediately after loading drives moisture from the wood and allows sufficient heat up the flue to prevent condensation. Following this practice will keep creosote formation to a minimum.

## 5. Maintenance

### Glass Cleaning

Do not attempt to clean the glass when it is hot. Allow it to cool and wipe with a cloth and a vinegar water solution. Do not scrape the glass with anything or use any abrasive materials. Scratches made in the glass can later develop into cracks. Replace cracked or broken glass with 4mm ceramic replacement glass from your dealer.

### Summer Storage

At the end of the heating season the flue, pipe, and stove must be thoroughly cleaned to prevent rust and corrosion from the acidic coal ash.

1. Remove the stove pipe and take the entire assembly outside. If you have a barometric damper, be careful not to disturb the balance weight. Wash and brush the inside of the pipe until it shines. After the pipe has dried, coat the inside with a solution made from 1 lb. of baking soda to 1 gallon of water. Reassemble the pipe, sealing the joints and set it aside until the stove is cleaned.
2. Remove the hopper and grates and clean thoroughly with a wire brush.
3. Open the traps on the heat exchanger (part 18), brush and vacuum the exchanger and the entire inside of the stove.

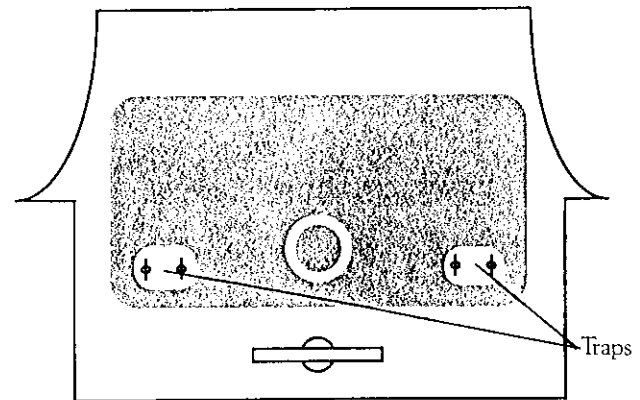
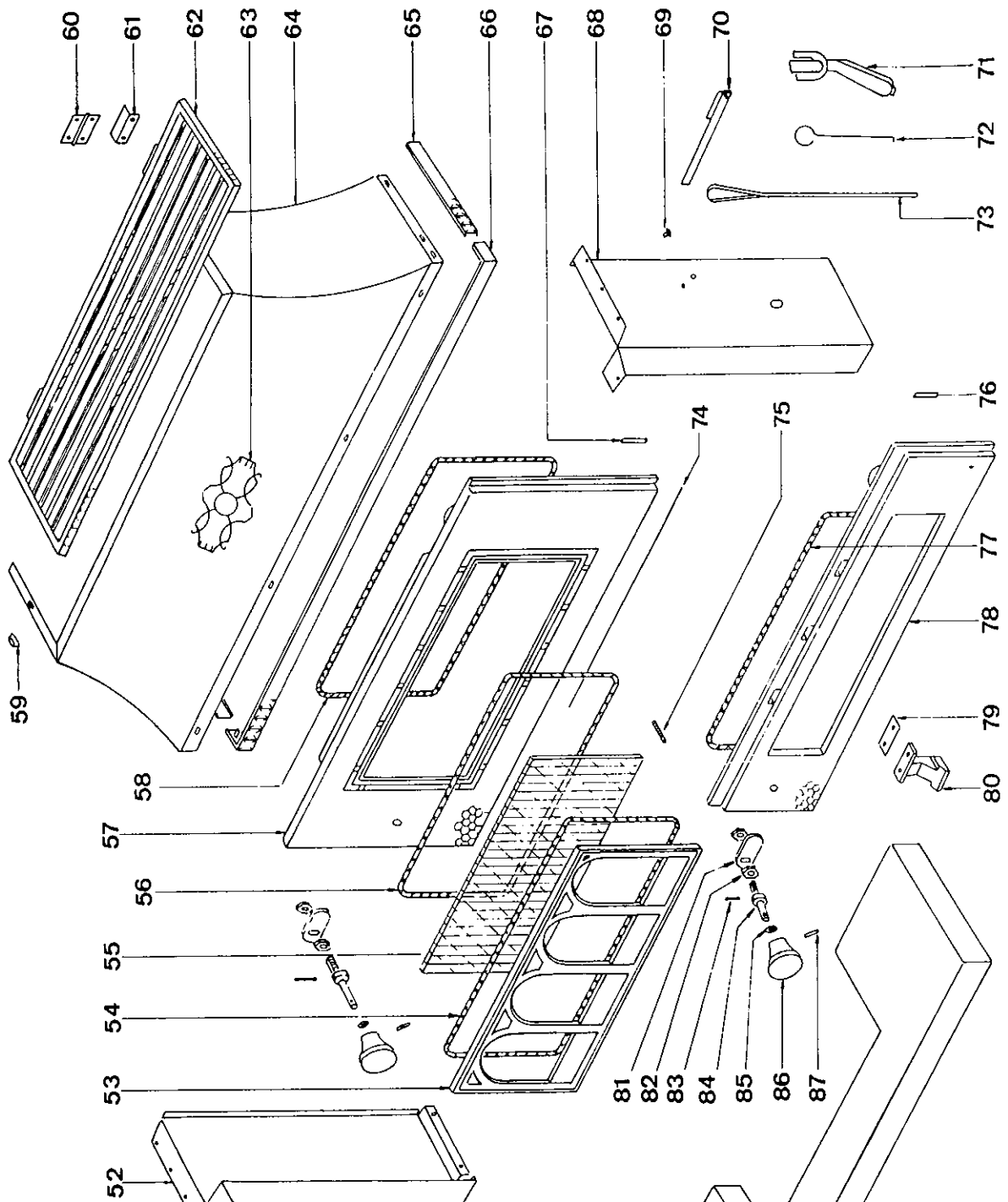


Figure 6: Heat Exchanger Traps

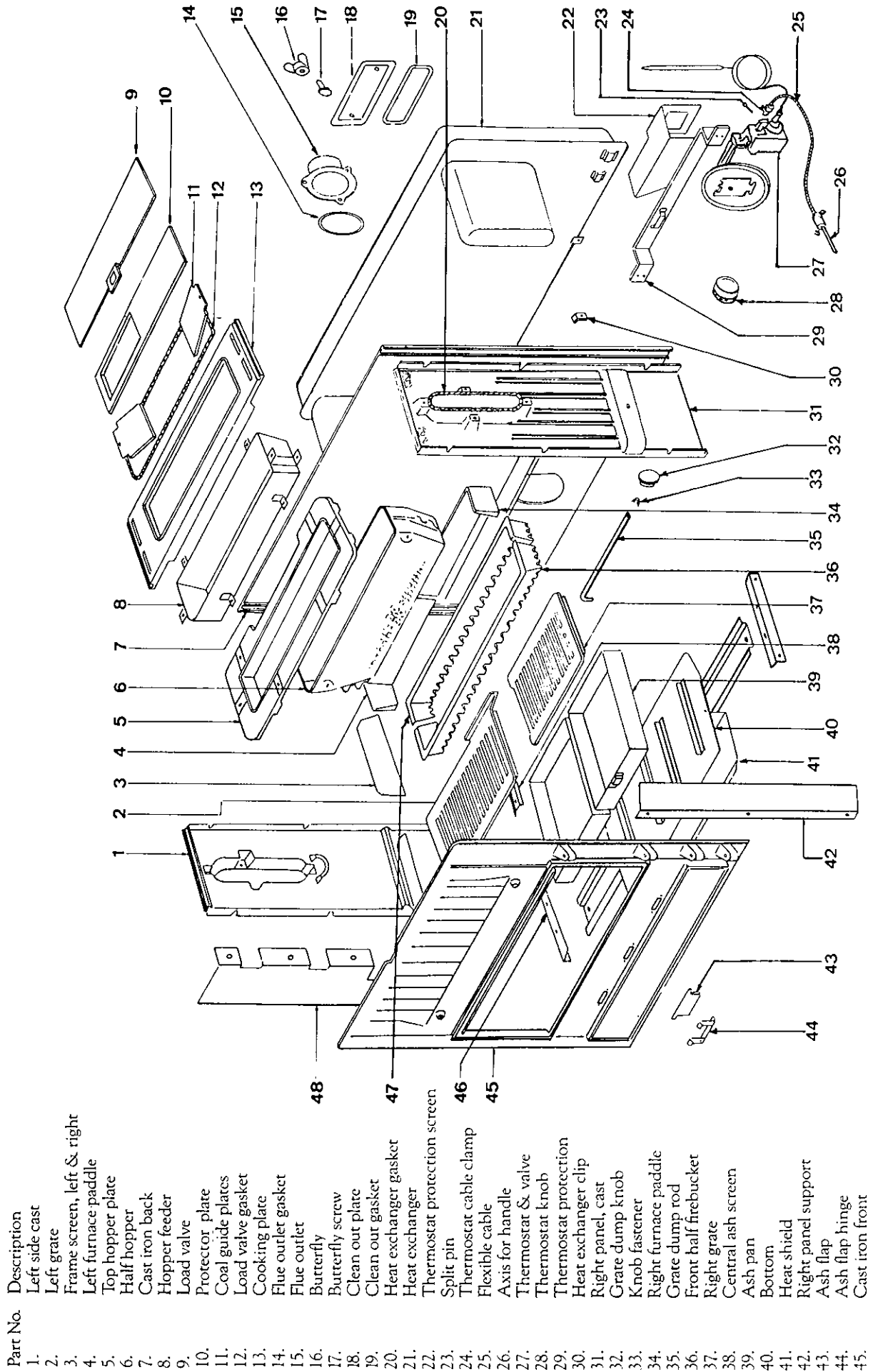
4. Reassemble the stove and traps. Oil the hinge pins and door latches.
5. Replace worn out gaskets. Loose gaskets can be re-attached with gasket cement.
6. Leave the stovepipe disconnected during the summer. With the pipe connected moist air is continuously pulled through the stove and can cause it to rust.

Figure 1: Exploded View



- 46. Cabinet support
- 47. Rear half fire basket
- 48. Left panel support
- 52. Left side panel
- 53. Cast window frame
- 54. Gasket
- 55. Glass
- 56. Gasket
- 57. Viewing door
- 58. Gasket
- 59. Hood fastener
- 60. Hinge
- 61. Top stop
- 62. Cast iron top
- 63. Ornament
- 64. Hood
- 65. Side border
- 66. Front border
- 67. Hinge pin
- 68. Right side panel
- 69. Rivet
- 70. Stove support
- 71. Stove operating tool
- 72. Hook
- 73. Poker
- 74. Coppered iron wire
- 75. Socket screw
- 76. Hinge pin
- 77. Gasket
- 78. Ash door
- 79. Leg attachment plate
- 80. Leg
- 81. Snap lock
- 82. Hexagon nut
- 83. Split pin
- 84. Axis for door handle
- 85. Washer
- 86. Door knob
- 87. Knob pin
- 88. Skirt

Figure 1: Exploded View



Part No.

Description

1. Left side cast
2. Left grate
3. Frame screen, left & right
4. Left furnace paddle
5. Top hopper plate
6. Half hopper
7. Cast iron back
8. Hopper feeder
9. Load valve
10. Protector plate
11. Coal guide plates
12. Load valve gasket
13. Cooking plate
14. Flue outlet gasket
15. Flue outlet
16. Butterfly
17. Butterfly screw
18. Clean out plate
19. Clean out gasket
20. Heat exchanger gasket
21. Heat exchanger
22. Thermostat protection screen
23. Split pin
24. Thermostat cable clamp
25. Flexible cable
26. Axis for handle
27. Thermostat & valve
28. Thermostat knob
29. Thermostat protection
30. Heat exchanger clip
31. Right panel, cast
32. Grate dump knob
33. Knob fastener
34. Right furnace paddle
35. Grate dump rod
36. Front half firebucket
37. Right grate
38. Central ash screen
39. Ash pan
40. Bottom
41. Heat shield
42. Right panel support
43. Ash flap
44. Ash flap hinge
45. Cast iron front