Mulberry™

Cast a warm eye on life

JOYCE Boiler Multi-Fuel STOVE
Installation & Operation Guide

It is essential for Safe operation of this heating appliance that the instructions set out in this book are followed. Please keep this book such that it is available to any user of the stove.

ENJOY YOUR STOVE -- SAFELY

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MULBERRY Joyce Boiler Multi-Fuel stove

Getting Started

Congratulations on your purchase of this quality Mulberry stove. With proper preparation, installation and use this product will provide a lifetime of warmth.

Unpacking the stove

Step 1:
Remove the stove from the packaging, then open the fire door and ash door and remove the following contents from the stove. See Fig 1 below to see the contents of the packaging and the main components of your new Mulberry Stove.

1. Hob.
2. Ash Pan.
3. Legs x 4.
4. Operating tool.
5. Door handle and screw.
6. Fire Fence
7. Boiler Tapping Adapter x 2

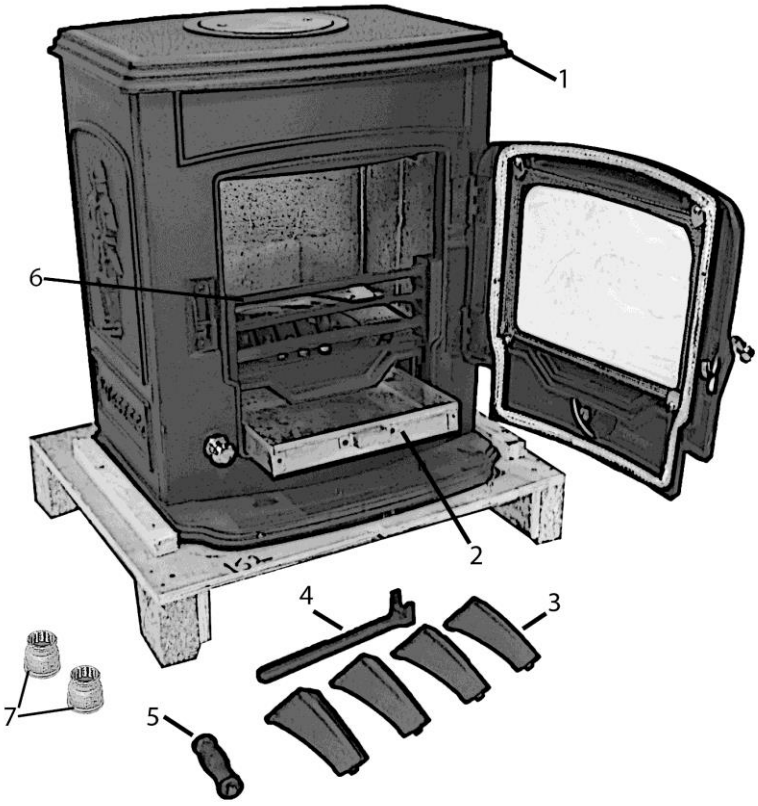


Fig 1.

Step 2:
Open the small plastic bag. Remove the door handle and screw. Insert the screw into the handles. Screw handles to spigots on stove door as shown in Fig.2

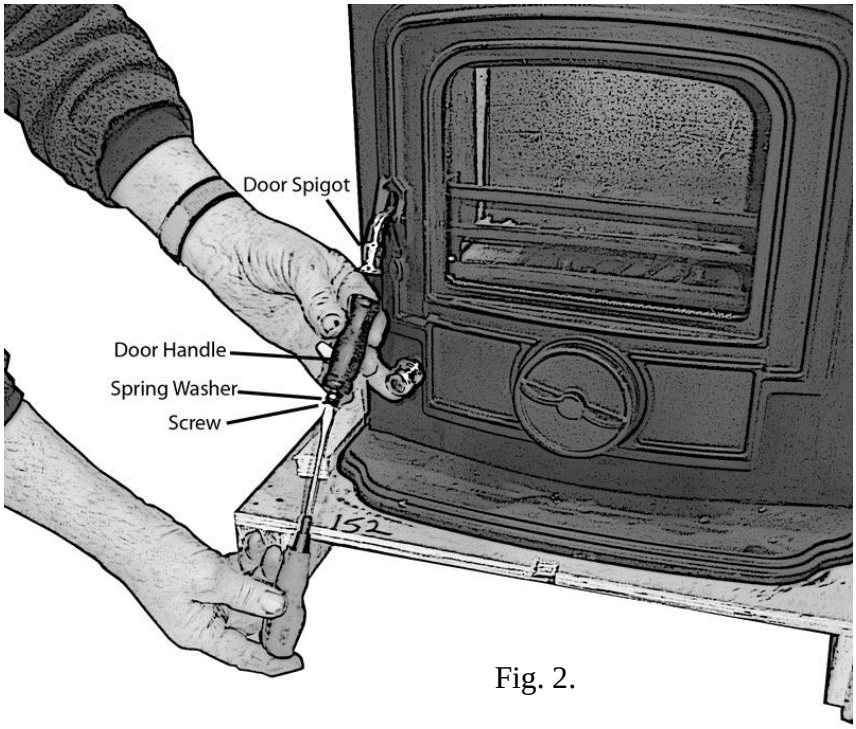


Fig. 2.

Step 3:
Place a cushion or some protective material on the floor and lay the stove on its back. Fit the legs at each corner of the base using bolts in the base of the stove. Tighten the bolt to secure the leg in place. Fig 3.

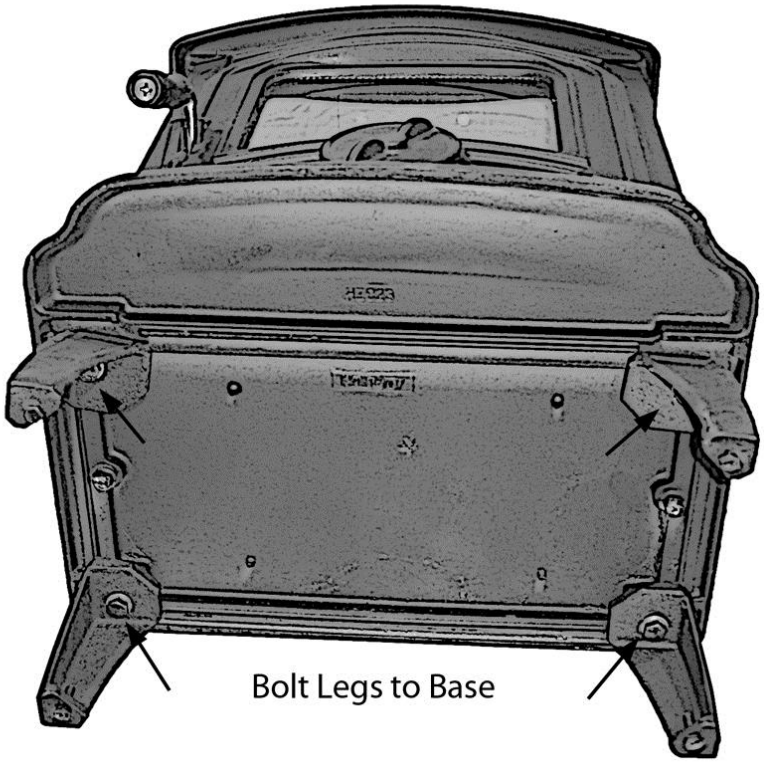
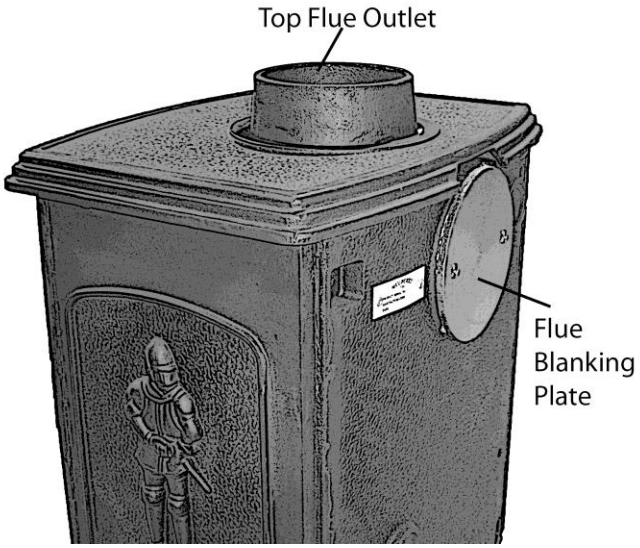


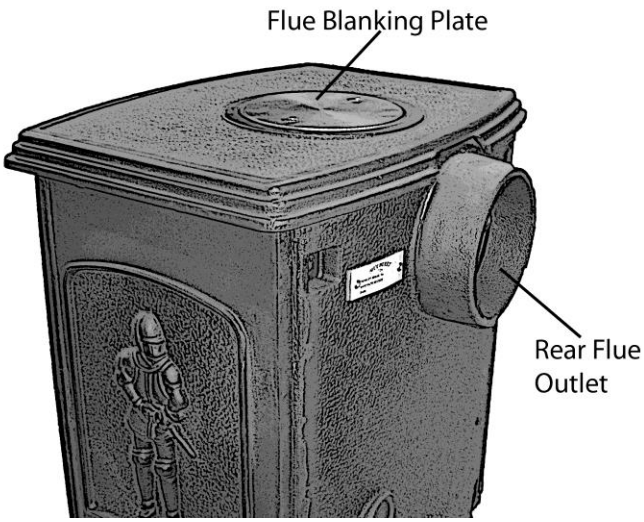
Fig 3.

Step 4:
Carefully stand the unit upright on its legs. Do NOT drag the stove across the floor on its legs or you risk breaking a bolt.

Step 5:
a) If chimney connection is to be at the back of the stove, remove the back flue blanking plate and fit flue collar making sure sealing rope is in place. Screw flue blanking plate onto top flue opening. See Fig.4.
b) If the chimney connection is to be on the top of the stove fit flue collar to the top of stove, making sure sealing rope is in place and secure with screws. See Fig.4.

Fig 4.





Congratulations your Mulberry Stove is now ready for installation!

Plan Ahead

A safe stove installation involves several elements, including –

- consideration of Ventilation & Combustion air requirements
- the flue pipe or chimney connector
- the chimney itself
- the connection between the flue pipe and chimney, and
- protection of combustible materials in the vicinity of the stove
- full compliance with local Building Regulations

Each of these elements is equally important for a safe stove installation.

VENTILATION & COMBUSTION AIR REQUIREMENTS

Over and above local Building Regulations, provision for outside combustion air may be necessary to ensure that fuel-burning appliances do not discharge products of combustion into the house. Building Regulations Guidelines to determine the need for combustion air may not be adequate for every situation. Whether required by the local Building Regulations or not, it is advisable to provide permanent ventilation to outside air supply in any room where a stove is situated.

Outside combustion air is particularly required if:

- The solid-fuel-fired appliance does not draw steadily, smoke rollout occurs, fuels burn poorly, or back-draughts occur whether or not there is combustion present.
- Existing fuel-fired equipment in the house, such as fireplaces or other heating appliances, smell, do not operate properly, suffer smoke roll-out when opened, or back-draught whether or not there is combustion present.
- Opening a window slightly on a calm (windless) day alleviates any of the above symptoms.
- The house is equipped with a well-sealed vapour barrier and tight fitting windows and/or has any powered devices that exhaust house air.
- There is excessive condensation on windows in the winter.
- A ventilation system is installed in the house.

If these, or other indications, suggest that infiltration air is inadequate, additional combustion air should be provided from the outdoors. Outside combustion air can be provided to the stove using either an Indirect Method, or a Mechanical Ventilation System as described below –

- <u>Indirect method</u>
  - for an appliance not certified for direct connection of outside combustion air, the outside air is vented into the room at a point no closer than 300mm from the appliance, to avoid affecting the performance of the stove.
- <u>A mechanical ventilation system</u>
  - If the house has a ventilation system (air change or heat recovery) –
    - The ventilation system may be able to provide sufficient combustion make-up air for the solid-fuel-fired appliance.
    - The ventilation system might need to be re-balanced by a ventilation technician after installation of the appliance.

WARNING
Connection to type "B" Gas Vents that are approved for connection to gas-burning appliances only, will result in a fire.
Do not connect to, or use in conjunction with, any air distribution ductwork unless specifically approved for such connection and/or use.

Flue Pipe (Chimney connector)

The flue pipe is used to connect the stove to the chimney. The chimney connector should be of corrosion resistant "black" or "blued" or equivalent treated steel, with a minimum thickness of 24 gauge. Do **not** use aluminium or galvanized steel pipe as a chimney connector. These materials cannot withstand the extreme temperatures of a solid fuel fire and can give off toxic fumes when heated. Do not use chimney connector pipe as a chimney. The space between the spigot on the stove flue and the flue pipe should be sealed with stove cement or an appropriately size piece of gasket. This allows any small amounts of condensed creosote to run into the stove rather then onto the outside of the pipe or the stove top. All joints should be secured with sheet metal screws to ensure that the sections will not separate. For proper operation the flue pipe should be as short as possible. Horizontal lengths should have a minimum upward slope from the stove of 6mm per 300mm. Avoid using more than two 90-degree elbows or total runs of pipe greater than 2 metres. The flue pipe should be installed so as to avoid sharp turns or other features that would create resistance to the flow of flue gases. The length of the flue pipe should be securely supported at intervals, with joints fastened with sheet-metal screws or other approved means. The entire length of a connector should be readily accessible for inspection, cleaning and replacement.

No part of the flue pipe may pass through an attic or roof space, closet or other concealed space, or through a floor or ceiling without provision of a purpose designed insulated "pass-through" where the flue pipe is within 500mm of combustible materials.

Whenever possible, avoid passing the flue pipe through a combustible wall. If this is unavoidable, extreme care must be exercised.

An approved installation that uses a section of listed solid fuel insulated factory-built chimney as a pass- through for the flue pipe must have an inside diameter which is 51mm larger than the flue pipe - a minimum length of 300mm -and at least 26mm of insulation thickness. The chimney section is installed with at least 51mm of air space between the outer chimney wall and adjacent combustible materials.
Sheet steel support plates are used on both ends of the chimney section to keep the flue pipe centred. The opening around the chimney section is closed on both sides of the wall with sheet steel plates and the chimney section is securely fastened to the plates. Fasteners used to support the chimney section should never penetrate the inner flue liner.

Wall Pass-Through

It is emphasised that when your installation unavoidably requires that the flue pipe pass through a combustible wall to reach the chimney, **extreme care must be taken**.

In the U.S., the National Fire Protection Association's publication NFPA 211, Standard for Chimneys, Fireplaces, Vents, and Solid Fuel Burning Appliances, permits four methods for passing through a combustible wall. In Canada, refer to

CAN/CGA 6356. Before beginning the installation, contact local building officials to make sure the proposed pass-through method meets local building code requirements. A commonly used method to pass through a wall directly to a masonry chimney requires removal of all combustible material from at least 300mm a round the entire flue pipe. The space is then filled with at least 300mm of brick around a fireclay liner. Be sure to locate it so that the top of the flue pipe will be at least 500mm below the ceiling.
To construct the brick pass-through, you will need an opening of 762mm x 762mm minimum. It will be necessary to cut wall studs, install headers, and construct a sill frame to maintain proper dimensions and to hold the weight of the brick. Minimum 90mm (100mm nominal) thick solid bricks are to be used.
The fireclay liner (ASTM 035 or equivalent), minimum 16mm wall thickness, must not penetrate into the chimney beyond the inner surface of the chimney flue liner and must be firmly cemented in place. If it is necessary to cut a hole in the chimney liner, use extreme care to keep it from shattering. Refractory mortar must be used at the junction to the chimney liner.

Chimney

There are two types of chimneys suitable for the Mulberry stove –

- An approved masonry chimney, or
- An approved prefabricated residential-type building heating appliance chimney.

There are basically two methods of chimney installation –

- Chimney inside the residence running up through the ceiling and the roof, or
- Exterior chimney that runs up the outside of the house.

When selecting a chimney type and the location for the chimney in the house, remember that it is the chimney that makes the stove work, not the stove that makes the chimney work. This is because a chimney actually creates suction, called draught, which pulls air through the stove.

Several factors affect draught, particularly –

- Height,
  - a minimum chimney height of 4.57 metres from the floor on which the stove is installed is required for the Mulberry
- Cross-sectional area,
  - The chimney flue for the Mulberry Joyce must have a diameter of at least 125mm.
  - It is best to connect to a chimney of the same cross-sectional area, as connection to a larger size may result in less draught.
- Temperature of the chimney, as well as
- Proximity of surrounding trees or buildings.

In general, a short masonry chimney on the exterior of the house will give the poorest performance. This is because it can be very difficult to warm up, and in extremely cold northern areas it may not work at all.
A tall masonry chimney inside the house is easier to keep warm and will work best,

This guideline gives the necessary chimney requirements based on the U.S. national code (NFPA-2n). However, many codes differ from the U.S. code to take into account climate, altitude, or other factors. It is important that you check with your local building officials to find out what codes apply in your area before constructing a chimney.

Masonry Chimneys

An existing masonry chimney should be inspected, and, if necessary, repaired by a competent mason or relined, using an approved relining system.

The minimum requirements for a properly constructed chimney include the following:

- The foundation must be large enough to support the intended chimney without settling.
- The masonry wall of the chimney, if brick or modular block, must be a minimum of 100mm nominal thickness. A mountain- or rubble-stone wall must be at least 300mm thick.
- The chimney must have a fireclay flue liner, or equivalent, with a minimum thickness of 16mm and must be installed with refractory mortar. There must be at least 12mm air space between the flue liner and chimney wall.
- The preferred fireclay flue liner size has a nominal size of 200mm x 200mm, and should not be larger than 200mm x 300mm. If round fireclay liners are used, the inside diameter should be 125mm and not larger than 200mm. If an existing chimney with larger tiles is used it should be relined with an appropriate liner.
- No other appliance can be vented into the same flue.
- An airtight cleanout door should be located at the base of the chimney.
- A chimney inside the house must have at least 50mm of clearance to the combustible structure.
- A chimney outside the house must have at least 25mm clearance to the combustible structure.
- Fire stops must be installed at the spaces where the chimney passes through floors and/or ceilings.
- There must be air space around the chimney, and insulation must be 50mm or more from the chimney.
- A chimney of masonry or prefabricated metal must be the required height above the roof or other obstruction for safety and for proper draught operation. The requirement is that the chimney must at least 76mm higher than the highest point where it passes through the roof and at least 50mm higher than the highest part of the roof or structure that is within 255mm of the chimney, measured horizontally
- Chimneys shorter than 4.57 metres may not provide adequate draught. This could result in smoke spilling into the room from the door or joints in the stove or pipe. In addition, inadequate draught can cause puffing. A too-strong draught causes excessive temperatures and can shorten burn times. Excessive draughts can be corrected by having your dealer install a barometric damper at 2.54mm of water column. If you suspect you have draught problems, consult your dealer.

Metal Prefabricated Chimneys

The Mulberry Joyce stove must be connected to an approved and listed Type HT per Underwriters' Laboratory Standard UL103 or ULC 5629 prefabricated chimney. When a metal prefabricated chimney is used, the manufacturer's installation

instructions must be followed precisely. From the same manufacturer purchase and install the ceiling support package or wall pass through, the "T" section package, the firestops (when needed), the insulation shield, the roof flashing, the chimney cap, etc. Maintain the proper clearance to the structure as recommended by the manufacturer. This clearance is usually a minimum of 50mm, although it may vary by manufacturer or for certain components.

Chimney Cleaning

Inspect the flue pipe frequently. Tap the flue pipe with a finger when the pipe is cool. A dull echo indicates that the pipe may need cleaning. Disassemble the chimney connector and clean the sections. Replace corroded pipe sections.

When inspecting a masonry chimney, start at the clean-out door, normally found in the basement, at the base of the chimney, or on the outside. If the chimney does not have a clean-out door it must be inspected and cleaned by removing the stove from chimney.

Connection to the Chimney

Masonry Chimneys

When connecting to a masonry chimney, a “clay pot adaptor” should be used as the connection between the 8”or 9” diameter clay lining of the chimney and the 5” diameter pipe or bend connected to the Joyce stove. The pipe or bend should be sealed into the clay pot adaptor with refractory cement and the pipe or bend should also be mechanically secured to the chimney.

Prefabricated Chimneys

Always follow the chimney manufacturer's instructions and use all the components required by the manufacturer. Do not take shortcuts or use make shift methods for securing the flue pipe to the chimney.

Protection of Combustibles

Clearances to Combustibles

A combustible is anything that can burn, and in the case of stove installations, these combustibles may not be visible. If you are not sure of the combustible nature of any material in the vicinity of your planned stove installation, you should check with your local fire officials. Remember that "fire resistant" materials are considered combustible; they are difficult to ignite, but they will burn. The diagrams in Appendix 3 give the required clearances that must be maintained from unprotected combustible materials or objects.

Installation clearances

Maintain at least the following clearance to all combustible materials.

From the Back	420mm	18”
From the Sides	510mm	20”
From the Corners (Corner Installation)	330mm	13”

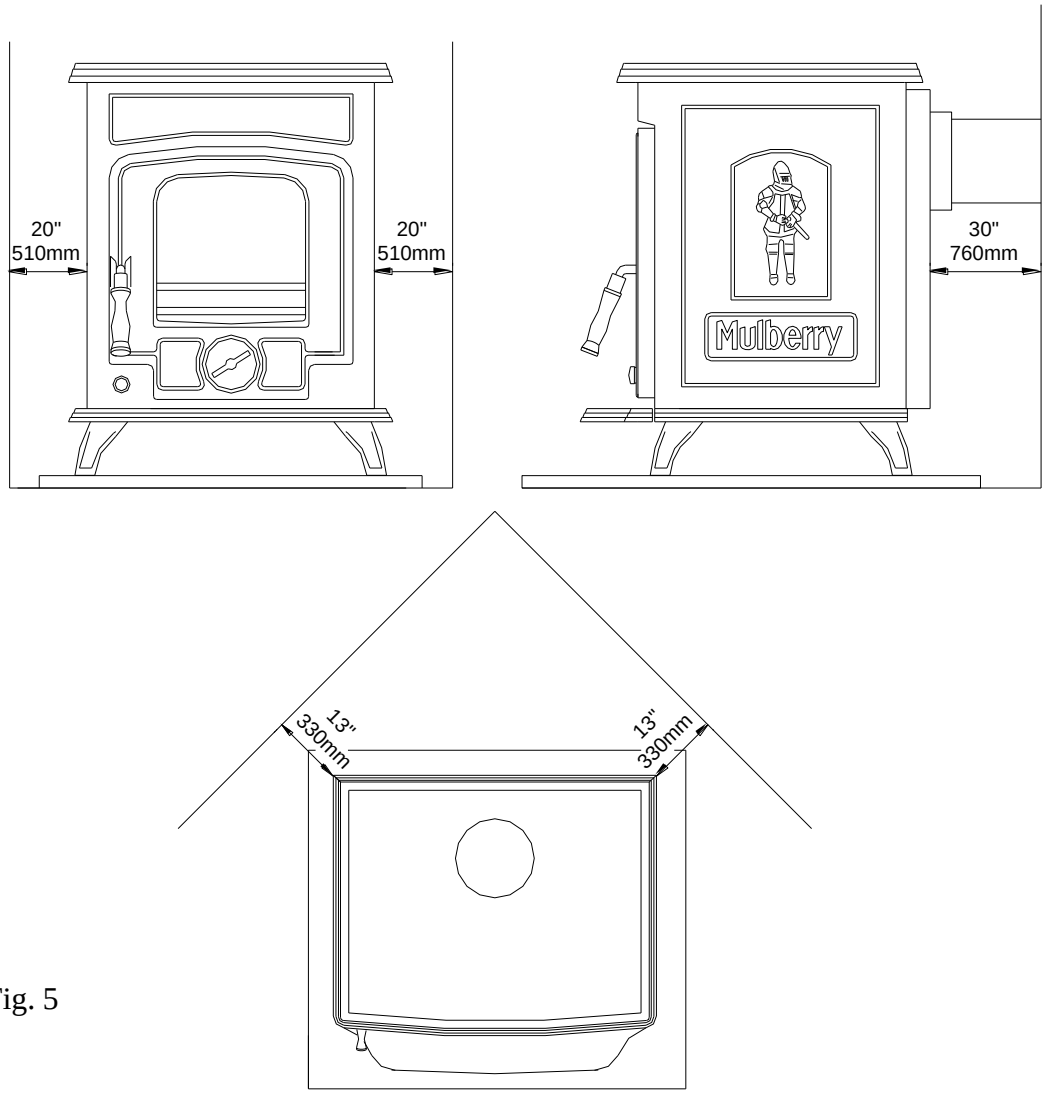


Fig. 5

CAUTION: If you have recently purchased a home that has a stove hearth in it that you plan to use, it is extremely important that the entire system be examined for safety. Many older homes may have faulty chimneys, or previous owners may have covered combustible walls or studs with brick veneers. Heat is conducted readily through brick and could ignite unseen combustibles behind it.
Contact local building or fire official about restrictions and installation requirements in your area

Floor Protection

The Mulberry stove must be placed on a **non-combustible surface** at least 13mm thick that extends at least 200mm beyond the sides and back of the stove and 460mm in front of the stove. See Figure 6 below.
This is the minimum floor protector size. Floor protection must also be used under the stove flue pipe if exiting from the rear of the stove. This protection must extend 50mm beyond either side of the pipe.
Mulberry granite stove plinths that are purpose designed to protect your floor and provide an attractive setting for your stove are available from your Mulberry stockist. They are available in 2 ft x 2 ft (610mm x 610mm), and 3 ft x 2 ft (910mm x 610mm).

WARNING: **Never** put any type of floor protection on top of carpeting.

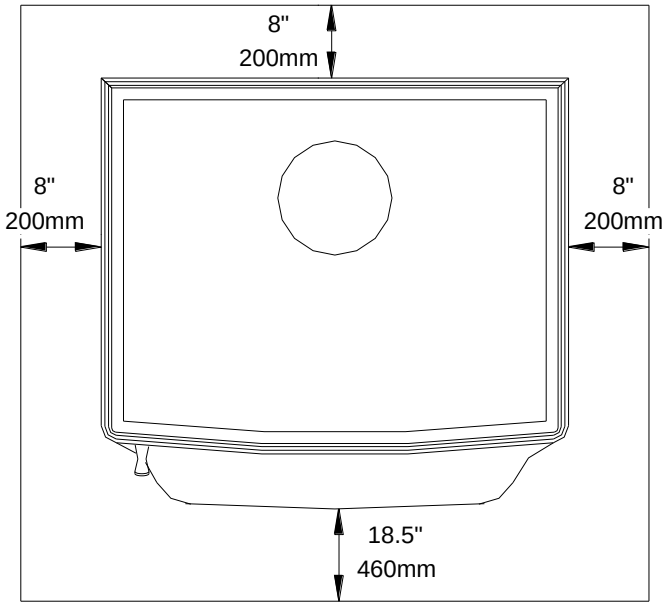


Fig. 6

Alternate Floor Protection

All floor protection materials must be non-combustible (i.e., metals, brick, stone, mineral fibre boards, etc.). Organic materials such as plastics, wood, paper products, and so forth are combustible and must not be used.

Plumbing

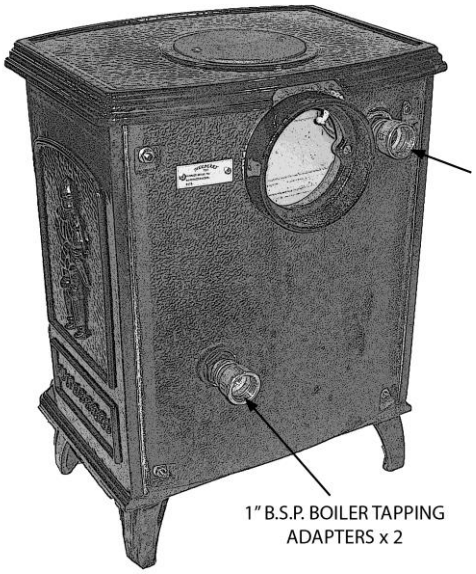
All plumbing should be installed by a competent craftsman and must comply with relevant national standards.

The pipe fittings on your MULBERRY Joyce stove are 1" BSP.

- First you must fit the 1" BSP adapters to the back off the stove as in Fig. 7 below. Make sure to use PTFE tape or equivalent to seal the threads.
- All Piping to and from the stove should be 1" or equivalent.
- An indirect cylinder should be installed in the system and there must not be more than 25 feet of piping between the stove and the cylinder. This stove is sized to provide Domestic Hot Water and heat up to 2 radiators.

An expansion pipe must be fitted for the outlet from the stove and this must be vented to atmosphere.
There must be no valves on the pipes between the stove and the cylinder or on the expansion pipe. See Fig 8. for general diagram of a stove plumbing arrangement.

Fig. 7



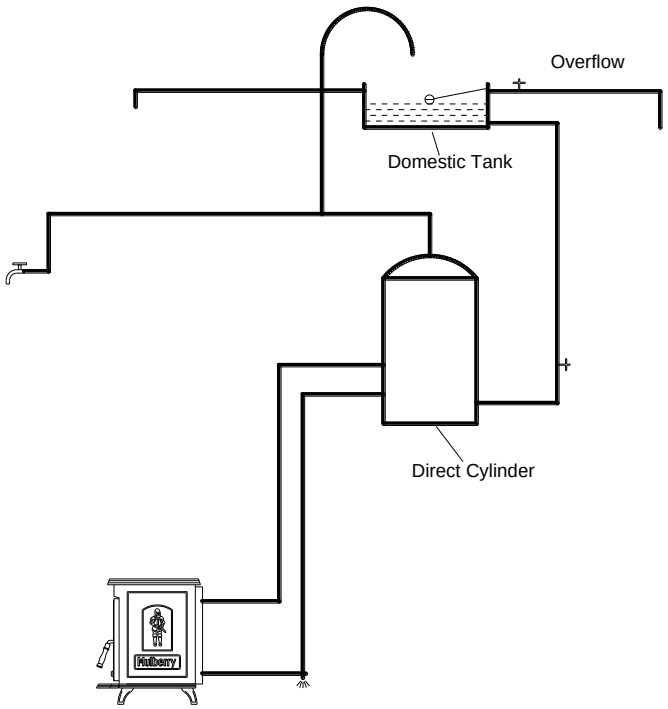


Fig. 8

Operation

Before building a fire in your new stove, please read the following section carefully.

The Joyce stove is designed to burn solid fuels. Stove outputs are based on burning grade "A" house coal and reduced outputs will be achieved if burning fuels of lower calorific values. Higher efficiencies and lower emissions generally result when burning air-dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods.

The approximate calorific values of various fuels are --

Anthracite	8.2 kW/Kg
House coal	7.2 kW/Kg
Wood (dry)	5.0 kW/Kg
Peat Briquettes	4.8 kW/Kg
Bog peat	3.4 kW/Kg

Do not burn:

- Household rubbish
- Cardboard
- Treated or painted Wood Solvents
- Treated or painted Wood
- Chemical Chimney Cleaners
- Coloured Paper
- Any synthetic fuel or logs that have not been approved for wood stoves.

Burning treated wood, rubbish, solvents, coloured paper, chemical chimney cleaners, or trash may result in release of toxic fumes and may cause the stove to overheat.

Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or "freshen up" a fire in this stove. Keep all such liquids far away from the heater while it is in use.

Fuel Storage

When storing solid fuel outside, it should be covered and stored off the ground to protect it from the elements.

If storing wood, 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 best performance from your stove, we recommend using seasoned hardwood that has been dried and stored under cover for at least one year. Burning unseasoned or wet wood causes the rapid development of creosote and reduces the heat value of the wood being burned.

Creosote and Soot Formation and the Need for Removal

When solid fuel is burned slowly, it produces tar and other organic vapours that combine with expelled moisture to form creosote. These creosote vapours condense in the relatively cool chimney flue of a slow burning fire. The creosote that accumulates in the flue is highly flammable and is the fuel of chimney fires. To prevent a chimney fire, the creosote needs to be removed by sweeping the chimney and flue pipe. The frequency of sweeping will depend on how the stove is operated, 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 the chimney or flue pipe ignites, the resulting fire is often accompanied by a roaring noise and a crackling sound as flakes of burned creosote break loose. If a chimney fire is suspected, immediately close the draught regulator and make sure the stove door is closed. Call the fire department and get everyone safely out of the house.

Trying to extinguish the fire in the stove will not help. In fact it can make the matter 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 the door is opened. After a chimney fire, do not use the stove until the chimney and the flue pipe have been cleaned and inspected to ensure that no damage has been sustained.

Breaking in the Mulberry Stove

A cast iron stove should be "broken in" gradually. Five consecutive small fires must be built in the stove prior to operating the stove continuously. Each fire should be a little larger than the previous one, and the last fire should be a full-sized load. Allow the stove to cool completely between fires.

It is normal for new painted stoves to emit a smell or even some smoke during the first few fires. The seasoning of the high temperature paint causes this, and the odour will diminish with each fire and eventually disappear. Opening a window or door near the stove will help provide additional ventilation and reduce the odour.

Controls

Air control

Air supply on the Joyce stove is controlled by the Spin Valve located at the bottom of the stove door. (See Fig 7.) The air entering through the Spin Valve provides both

combustion air to the firebox, and an air wash to the glass in the fire door. Adjusting this Spin Valve will give desired level of heat from the stove by controlling the amount of air entering the firebox. This should be fully opened when lighting the stove and adjusted to the required position when the stove is burning normally. Turn anti-clockwise to open and give greater heat output and clockwise to close.

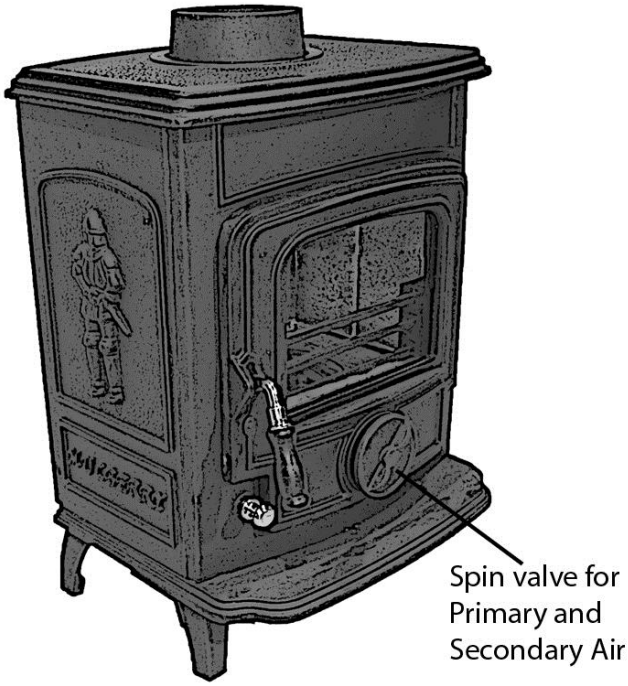


Fig 9.

CAUTION
Since the stove is Hot while in operation, keep children, clothing and furniture away. Do not store fuel within the clearances listed previously.

Starting a good fire

• Make sure the Spin Valve air draught control is fully open to promote Maximum Burn. Open the front door and cover the bottom of the stove with tightly crushed newspaper. Criss-cross a generous amount of firelighters or dry kindling, such as split pieces of scrap timber, on top of the paper. Place a small amount of fuel such as 1 or 2 dry split logs, or 3 or 4 peat briquettes, or a few pieces of coal or turf, on top of the firelighters or kindling.
• Light the paper evenly across the front and close the door.
• When the initial pieces of fuel are burning healthily, continue to add fuel until a healthy bed of glowing embers has formed to the desired size.
• Allow this to burn for several minutes. Once the stove is burning well, adjust the air control to the desired heat output level. Avoid operating the stove with the air control closed completely.
• In order for secondary combustion to occur, the fire must be well established with temperatures above 600°C in the firebox.
• If the fire dies out, this cause is most likely either an insufficient bed of fully burning fuel, reducing the air supply too soon, or using damp logs as fuel.

Benefits of a Good Fire
A good fire will efficiently utilize your fuel, keep emissions and creosote to an absolute minimum, require less work, and be predictable.

Reloading
Reload the stove while it is still hot and there is adequate heat to ignite the fresh fuel load. It is a good idea to include a smaller piece or two of fuel at the base of the new load to help the stove recover more quickly to its operating temperature.

Reloading Procedure
• Always wear gloves when tending the stove.
• Move the air control Spin Valve fully open to the Maximum Burn position.
• Wait a few seconds and open the door.
• Use a stove shovel or similar tool to break up any remaining embers and to move some live embers toward the front where combustion air enters.
• Load the fuel (Smaller pieces first).
• Close the door.
• Wait 5-10 minutes and adjust the air control to desired setting.

Ash Removal
- When ash builds up in the firebox shake the grate using the knob on the bottom left of the stove using the riddling tool (see Fig 8). This will move the ash off the grate and into the ash pan located under the firebox.

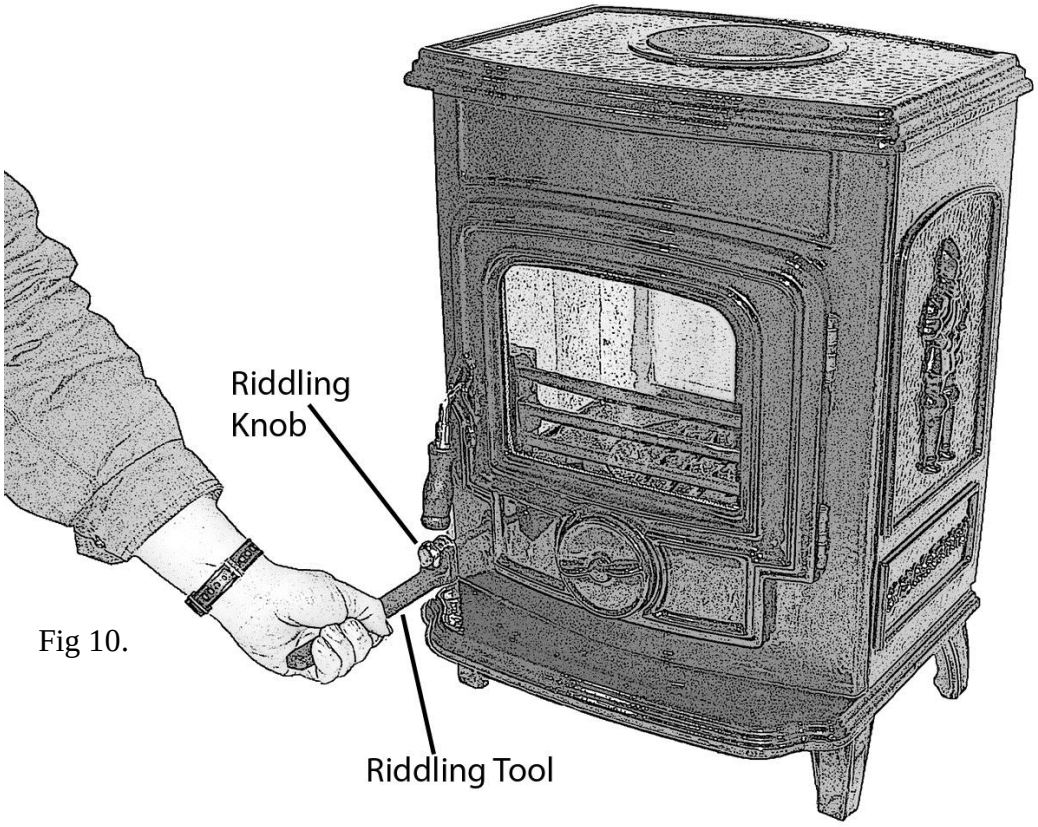


Fig 10.

- This ashpan will need to be emptied regularly during operation. If ash is allowed to build up to the fire grate it may cause the grate to burn out.
- When removing ash from a stove that is in operation, close and latch the door before taking the ashes outside for safe disposal. It is always a good idea to wear heavy protective gloves while removing and disposing of the ashes.
- Ashes should be placed in a metal container used exclusively for ashes, with a tight fitting lid. The closed container of ashes should be placed outdoors, well away from all combustible materials, pending final disposal. If ashes are disposed of by burying in soil or otherwise dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.
- Overfiring will result if the stove is operated with the door open. This could cause damage to the stove, void the warranty and/or lead to a house fire.

WARNING: Operate the Mulberry Joyce stove only with the door fully closed. Keep the door fully closed except when loading fuel or removing ashes. A partially open door may result in over firing.

www.mulberrystoves.com

Should you have any queries concerning the installation or operation of your Mulberry stove, please first check our website where the FAQ (frequently asked questions) section may answer your query. If you need to contact us, our 'phone, fax and email details are :-

Telephone:	051 897415
Fax	051 897451
email	info@mulberrystoves.com

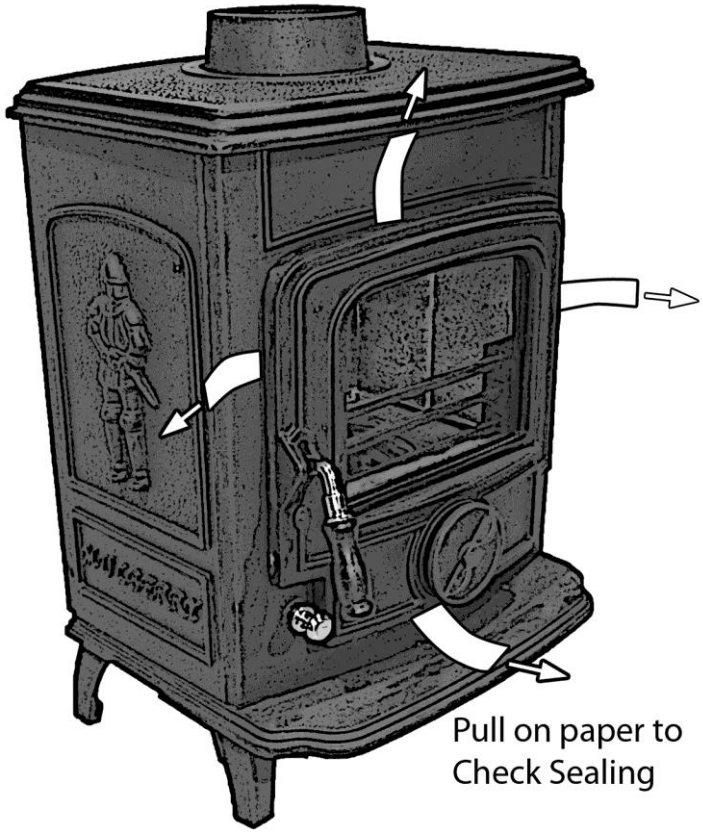
Maintenance

At least once a year, perform a routine maintenance check. A good time to do this is when the chimney and the flue pipe are being cleaned. The chimney and flue pipe should be cleaned whenever accumulations of soot and creosote reach 6mm thick, which may be several times a year, depending on how the stove is operated.

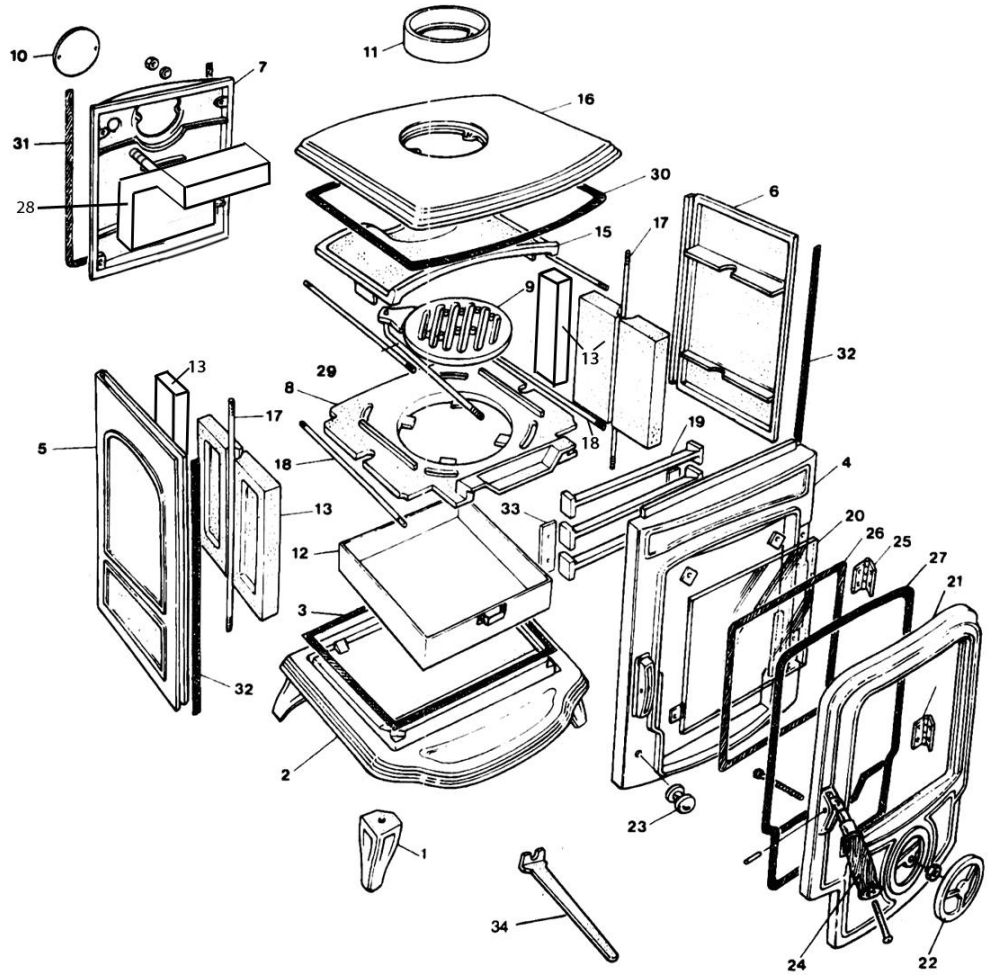
Thoroughly clean the entire stove. Brush all ash and soot out of the stove. It is better to brush out the ash and soot than to vacuum it out because soot particles are small enough to pass through most vacuum bags.
In a dark room, use a strong light to inspect the stove inside and out for cracks or leaks at corners and joints. Cracked parts should be replaced. Leaks at joints can be patched with stove furnace cement.

Check the door gasket for tightness. (See Fig 11. To do this, put a strip of printer or copier paper halfway into the stove, close and latch the door, and try pulling the paper out. If it can be removed easily the, seal is too loose. Check several spots around the door. To replace the gasket, scrape out all old gasket material and gasket cement. Spread a 3mm bead of stove cement into the bottom of the groove and press in new gasket.

Fig 11



Appendix 1: Boiler Model Exploded View



1. Legs
2. Base
3. Base sealing tape
4. Front
5. Left hand side
6. Right hand side
7. Back plate
8. Grate base plate
9. Grate
10. Outlet blank
11. Flue spigot
12. Ashpan
13. Side bricks
15. Top Baffle
16. Hob
17. Long tie bolts
18. Short tie bolts
19. Fire fence bars
20. Door glass
21. Door
22. Spin valve
23. Grate shaker control knob
24. Door handle
25. Door hinges
26. Door glass sealing tape
27. Door sealing rope
28. boiler
29. Grate shaker connecting rod
30. Hob sealing rope
31. Back plate sealing rope
32. Side plate sealing rope
33. Fire fence retainers
34. Operating Tool