OIL FIRED VAPORISING POT CONVERSIONS

Service Instructions 20-05-04

1. Introduction

The burners used on our vaporising conversions are blue flame, twin wall burners.

They range in output from 5 to 10 kw

Different burners are used on different appliances and details of them will be found in the installation booklet provided with the conversion kit.

Because all cookers are not installed in the same way, the output of the burner may have to be set up differently for each different installation.

The burner / valve assembly is set up at the factory to suit the appliance to be converted.

When setting the burner up, we make the assumption that the appliance to be converted has been correctly installed to the maker's specifications.

If the appliance has not been correctly installed the burner may well need to be adjusted on site to suit the individual situation.

1-1. Read First

These service instructions should be read in conjunction with the appropriate installer and user instruction sheets supplied with each conversion.

2. Health and Safety

2-1 Control of Substances

Take great care when handling materials such as:

Insulation boards, glass fibre ropes, ceramic wool, kerosene oil, diesel oil they are all irritants and suitable protective clothing such as disposable gloves dust masks and protective goggles should be worn.

Wash off thoroughly after handling any of these materials.

Carefully dispose of redundant or surplus materials and always vac up after service or installation work.

3. Principle of Operation

Blue flame, Vaporising pot burners are used extensively in Bubble Stoves and Conversion Kits.

They have no moving parts and are both long lasting and reliable.

They will burn Kerosene and Diesel fuel oil and they are not subject to the wick problems normally associated with sleeve burners.

Generally they can burn larger amounts of fuel than sleeve burners and can consequently be used to generate much higher heat outputs.

Although they are simple to use but they do need to be commissioned and maintained correctly.

The function of the burner is simple.

It has to convert the oil into gas and then mix the gas with the correct amount of air as quickly as possible, before efficient combustion can occur.

The pot is made from very thin steel to allow it to quickly heat up.

In the centre of the pot is a catalyser, which again is designed to heat up quickly and then radiate heat back onto the oil to turn it into vapour and start the continuous process occurring.

3-1 Rules for pot burners.

3-1-1. Established Installations

If the burner has been set up correctly and run successfully for a period of time, don't adjust anything; the problem will normally be a fuel flow one caused by carbon build up restricting the normal flow of oil.

3-1-2 New Installations

1. Read the manufacturers technical instructions thoroughly

2. Check the fuel viscosity on the valve data plate.

1.8 or 4.5

3. Check that the correct grade of fuel is in the tank Kero or Diesel

4. Make sure that you have an accurate vacuum gauge

5. Don't attempt any adjustments unless you have the gauge in the right place.

6. Don't adjust anything until the burner is settled in blue flame combustion

1. If you get sooting on high fire you have too much fuel or not enough air.

2. If the burner falls out of blue flame on low fire you don't have enough fuel.

3. If you get sooting at any firing rate or the burner does not respond to control the burner is flooded.

NEVER TRY TO LIGHT A FLOODED POT TO BURN EXCESS FUEL OFF.

3-2 Low firing rate cosiderations

The amount of heat required to get the pot up to its critical temperature is generally known as

THE LOW FIRING RATE MINIMUM

There are three states of low fire setting as follows

3-2-1. THE PERFECT LOW FIRING RATE.

3-2-2. THE MAINTAINING LOW FIRING RATE.

3-2-3. THE BEST LOW FIRING RATE.

Once the burner has reached the low firing rate minimum setting, the low firing rate could be reduced further to its **maintaining low firing rate**.

Once the pot is up to low firing rate it doesn't need as much heat to keep it there as opposed to getting it there.

Over a period of time the burner will build up carbon at the point where the oil flows into the pot, this build up will gradually slow down the oil flow.

This is not such a problem on the high firing side but if the low firing rate is set at its perfect setting then it could well not be sufficient to maintain the low fire in blue flame combustion.

Therefore we need to set the low fire rate slightly higher than the perfect setting and this is known as the **best low fire setting**.

3-3 HIGH FIRE CONSIDERATIONS.

The pot has a capacity to convert oil into gas and obviously it can only convert so much of it, if too much oil is allowed to flow into the pot faster than the pot can convert it all into gas, the pot will be chilled by the excess oil and stop converting the oil into gas.

This upper limit is known as

3-3-1 HIGH FIRE RATE MAXIMUM

Once this limit has been reached oil will build up in the base of the pot and the burner will burn with a large smokey yellow flame.

If this situation occurs the oil supply must be turned off immediately and the excess oil allowed to burn away,

(In the worst situations the burn off process can take up to 45 minutes)

To prevent this situation always set the high firing rate lower than the high firing rate maximum and this will ensure that the excess oil flow situation can never be reached.

3-4 FUEL AIR RATIO

Most of what has been mentioned earlier is about fuel air ratio.

3-4-1 OIL FLOW

The oil control valve controls accurate fuel flow and the service or commissioning engineer sets this to the required rate of flow.

3-4-2 AIR FLOW

Accurate airflow is always a problem as it is entirely at the mercy of the chimney performance and prevailing atmospheric/ chimney terminal conditions.

Conditions of excessive airflow through the burner can be regulated to some extent by the adjustment of the barometric damper.

There are certain locations, which are exposed to continuous high winds, and in these situations it may not always be possible to adequately control airflow through the burner.

It is better to advice customers against converting if these conditions are known to exist.

4. FLUE REQUIREMENTS

Each different appliance will have appropriate flue details specified in its technical installation details.
Detailed below is a typical requirement.

1. Chimney

1. To ensure satisfactory performance from the converted appliance hot and cold condition chimneys must be capable of maintaining a constant steady vacuum of not less than .02" W.G. when COLD or more than .06" W.G. when HOT,

The chimney or flue must terminate with a suitable anti downdraft cowl.

1. It is most important that any existing chimney faults such as: -

- ✓ Occasional or permanent down draught
- ✓ Excessive up draughts
- ✓ Fume leaks
- ✓ Regular blockages are established and corrected before any installation work is carried out.

3. If you are unsure about the condition of the chimney, have it thoroughly cleaned and checked by a suitably qualified person.

4. If the chimney is on an exposed wall, always reline and backfill around the lining with vermiculite to keep it warm and prevent condensation. (Lining dia 125mm)

5. The chimney should terminate 2 feet above the ridge of the main or highest roof, in compliance with relevant legislation.

7. Provision must be made to allow adequate and easy access into the chimney for cleaning purpose.

8. The flue pipe from the stove must not be less than 5" diameter and must comply to one of the following:

9. Acid resistant vitreous enamelled flue pipe to BS 1344 Part 2.

10. Stainless steel to BS1449 Part 2.

11. Cast iron to BS41.

12. Mild steel with a wall thickness of 3 mm minimum.

4-2. CHIMNEY TERMINATION

- ✓ The chimney must be terminated with a suitable anti downdraft cowl such as a VEDETTE or EUROCOWL ETC.
- ✓ Abnormal chimney terminal locations are very likely to cause problems under certain windy weather conditions.

4-3. BENDS IN FLUES AND CHIMNEYS

- ✓ Flues and chimneys should always be vertical wherever possible.
- ✓ On installations where using a bend is unavoidable the maximum allowable bend angle from the vertical is 45 degrees.
- ✓ 45-degree runs should be kept as short as possible (less than 1 metre long) and there should never be more than two bends used.
- ✓ Horizontal flue runs are not allowed, unless the stove is fitted with a rear flue, in this case the maximum allowable run will be 400mm.

5. OIL FEED AND STORAGE REQUIREMENTS

NOTE

1. 28 Second Commercial Kerosene to BS2869 Part 2: 1988 Class C2 is suitable for use with this appliance.35 second versions are available.

2. Installation of all oil feed pipe work and storage equipment should be in line with -: BS5410 Part1

Steel oil storage tanks to BS799 Part 5, if there is any doubt consult the tank manufacturer.

OFTEC requirements book T3 July 1995 rev.7.95

Minimum size storage tank should be 300 gals.

3. The burner can be supplied with oil via gravity or pumped oil feed system.

4. If a gravity system is used the base of the tank must not be less than half a metre or more than three metres above the burner.

5. Where the tank will be fitted at a lower level than the stove a lift pump must be used with max head above the burner base of 3 metres, the max head of the lift pump over the oil supply tank must not exceed 5 metres.

6. A suitable filter must be fitted and the minimum fuel line diameter is 10 mm but this is dependant upon the length of run.

7. If other appliances are being supplied from the same oil supply allowance must be made when pipe sizing to ensure that an adequate supply of oil be maintained for each appliance.

8. The oil line must be sleeved and sealed in a plastic tube where it passes through any brickwork.

9. A remote acting fire valve such as a Teddington KBB C 150 deg F must be fitted at the point where the fuel line enters the property.

10. There must also be an isolation valve fitted in the same room as the appliance in a conveniently accessible place.

11. Environment protection is of paramount importance.

Where properties are prone to be at risk from flooding take great care when fitting oil storage tanks.

Make sure that they are supported on reinforced concrete walls, which are built high enough to keep the tank well above any potential flood level and strong enough to withstand swollen river current or flood tide conditions. Make sure that the tank is firmly fixed to the supporting walls so as not to be washed away.

12. Tall, slim line plastic oil tanks must be secured to a substantial base to prevent them from being blown over when the are empty or have low oil content.

6. VENTILATION REQUIREMENTS

Air Supply to the Burner.

1. See Building Regulations J1/2/3 section 4. and BS5410 part1.

2. Calculate air requirements at 5.5 cm sq. per kW of output.

3. It is most essential that a permanent free air supply be established, as the burner cannot function correctly without it.

4. Provision for an adequate FREE air supply in to the room, space where the appliance is fitted is required.

It can be established by multiplying the kW output of the appliance by 5.5cm sq.

5. The air supply will take the form of a purpose designed, NON hit or miss, air vent of correct cross sectional area.

It is important that this air vent should not be obstructed in any way.

6. If an extractor fan is fitted in the same room as the appliance or if there is an open fire in an adjoining room then extra compensatory air must also be made available for both these extra requirements.

7. Minimum extra requirement for extractor fans is 55 sq cm and it is preferred if the extra air supply can be positioned in such a way as it can supply air to the extractor fan without the air stream passing the stove.

8. Minimum ventilation requirement for open fires is 212 sq cm

9. Test for adequacy of air supply is to-:

- ✓ Set the oil fired appliance going and close all doors and windows in the room
- ✓ Turn the extractor fan on to its maximum capacity.
- ✓ Light the open fire and let it get well established,
- ✓ Test for adequate maintenance of chimney vacuum on the stove, both before and after the extractor fan is turned on, with the open fire going.
- ✓ During the tests the flue vacuum of the oil-fired stove should be measured to see if there is any noticeable reduction beyond that called for in the appliance installation literature.

7. WATER HEATING ON CONVERTED APPLIANCES.

1. Existing central heating systems must comply with BS:5449 part 1.

4. If a combined heating and domestic hot water system is to be used, then a double feed indirect hot water storage cylinder to BS:1556 part 1 should be used.

5. In order to prevent the build up of scale and corrosion a suitable inhibitor should be used.

6. The system must be correctly vented.

7. The height differential between the header tank and the appliance must not exceed 15.2 metres (50 feet)

8. Whilst it is accepted that heating systems are sometimes already installed, you must be aware that if you are fitting a Bubble stove with non electric water temperature control the plumbing layout must be of a suitable design.

9. If it is not it will create a series of problems detailed in the faultfinding section of this publication.

7-1 GRAVITY SYSTEMS

1. On gravity- systems the hot water cylinder must be placed above the stove and as close as possible to it keeping horizontal runs as short as possible.

2. All gravity pipe work must rise on flow and fall on return and be a minimum of 28mm dia.

3. To reduce the resistance to flow, use swept bends, do not use elbows.

4. Use copper pipe work.

5. Use high water content radiators.

6. Use hot water cylinders with 28mm dia internal coils.

7. The primary circuit should have a total length of not more than

6 meters otherwise the recovery time of the hot water cylinder will be increased beyond an acceptable period of time.

8. Primary- circuit pipe work must not have valves or other devices that can be used to interfere with the free flow- of water.

9. A 1" safety valve must be fitted as close to the boiler as possible and the outlet from it must be directed to a safe location.

10. To reduce the build up of lime scale in the primary circuit pipe work the temperature of the water should not be allowed exceed 65 Deg C and a suitable water treatment should be added.

7-2 PUMPED SYSTEMS

1. Where pumped systems are employed, suitable injector tees should be used to induce the flow of water through the primary system.

2. Where additional radiators are fitted as heat leaks, the pipe work must be kept as short as possible, rise on feed and fall on return.

3. Where a common return is used an injector tee must be incorporated into the system to ensure adequate primary circulation when the circulating pump is operating.

4. The system must incorporate a gravity circuit which will normally heat the domestic hot water and unvalved radiators with a combined unvalved output of at least equal to the minimum water heating output of the stove (see individual stove specs for details.)

When the appliance is not connected to a domestic hot water system a gravity system must still be used with the unvalved radiator(s) on the gravity circuit having an output of at least the minimum output of the stove in case of pump failure.

6. All pipe work in the primary circuit must be 28mm diameter and the gravity flow pipe must rise continuously from the boiler to the open vent.

8. COMMISSIONING ROUTINE

Before attempting to light the appliance checks should be carried out on the following-:

- ✓ Tank- check for leaks-stability-height-position-vent.

- ✓ Fuel- check for correct grade
- ✓ Filter- is it fitted-check for function and leaks.
- ✓ TANK Site Glass- check for function and leaks
- ✓ Oil line- check for function, positioning, material suitability and leaks.
- ✓ Fire valve-check for function and leaks.
- ✓ Through Wall Sleeving - Check that it is fitted and sealed
- ✓ Isolation valve-check for function, convenience of positioning and leaks.
- ✓ Flush at least 5 litres of oil through the line to check for contamination and to clear the oil line of installation debris and trapped air.
- ✓ Electrical- check for correct fusing, location and specification of any isolation devices.
- ✓ Ventilation make sure that ventilation is provided in line with O.F.T.E.C requirements.
- ✓ Chimney system should be checked to make sure that it complies with the relative standards, Building Regulations and all other instructions given.
- ✓ Check the appliance is fitted with adequate clearances from combustibles.
- ✓ Check high and low fire as per section
- ✓ Check action of barometric damper.
- ✓ Ensure that the customer is instructed on the basic use of the appliance, timers, controls and oil / electrical isolation devices if fitted.

8-1 COMMISSIONING THE HIGH AND LOW FIRE

1. It is advisable to have a flue vacuum gauge available before carrying out this procedure.

2. When the burner has established combustion turn it up to half output.(Setting 3 on the fuel flow control knob) and let it settle down into blue flame combustion.

3. Allow at least half an hour for the chimney to warm up thoroughly before making any adjustments to the high or low fire screws.

4. Zero the vacuum gauge and insert the probe.

5. The vacuum should read between (.02" - .03") minimum or (.05" - .06") max

(If you can't get a reading investigate the cause by checking out the flue system and smoke bomb if required.)

6. Turn the burner down onto minimum firing rate and let the flame stabilise.

7. When the flame is stable the low fire catalyser should be glowing dull red in the bottom of the pot with wispy blue flames flicking in to the glowing edge of it.

8. If the flame drops out of blue flame combustion and falls into a dirty rolling yellow flame and the lower catalyser is not dull red then the low fire setting will need to be increased until it can support the required blue flame combustion.

Note to increase the low fire fuel flow, screw in on OCI valve and out on Toby valve, opposite for decreasing the fuel flow.

9. When you are happy with the low fire combustion, set the high fire as follows

10. Turn the oil flow knob up to setting 4; let the flame stabilise, and look at it, if it is stable and blue, turn it up slowly using the control knob, letting it stabilise after each movement.

11. If the flame starts to go yellow and progresses into long yellow flame combustion, it is running fuel rich and the high fire screw needs adjusting to reduce the flow of oil. (Screw in for both types of valve)

12. Do not make any attempt to adjust the high fire screw, until you have brought the flame back into blue flame combustion.

To do this turn the fuel flow down until the yellow flames drop back into blue flame combustion.

13. Adjust the high fire screw by half a turn in and try turning the fuel flow up, if it is still fuel rich repeat the process until the hire fire flame is running blue with flicks of yellow in the tips.

14. When you think that you have the flame as you want it leave it running for ten minutes to see if it is stable.

15. Adjustment of the flame will not be possible unless our instructions on chimneys and flue vacuum are followed.

16. If the burner does not burn with a blue flame recheck -:

a. The chimney vacuum

b. The oil flow rate

c. The seals in the appliance and that there is no ingress of air into the appliance flue ways.

8-2 Controls List

Each conversion will have a separate booklet provided which details the valve supplied with it.

OCI VALVES

Depending upon the model, converted appliance can have the following controls.

- ✓ Oil flow control knob 1 to 6. (You to set)
- ✓ Water temperature control knob. (You to set)
- ✓ Oil trip lever. (You to set and automatic)

THE oil trip safety fuel cut off lever is situated on the side of the valve; it takes the form of a small bent metal lever-projecting out from the side of the valve.

LIFT FOR OIL OFF.

PRESS DOWN FOR OIL ON.

The lever is designed to cut off the fuel supply into the oil control valve either manually or automatically consequently stopping the stove by shutting off the oil supply from the oil control valve. It is also designed to warn you of a problem with the oil control valve, if the stove goes out unexpectedly and you can't get the trip lever to trip on it is possible that oil has entered the safety float chamber thus automatically shutting off the oil supply into the stove.

If this is the case the valve will have to be de flooded.

2. OIL FLOW CONTROL KNOB

1. Controls the flow of oil into the pot and can be rotated to adjust the flow of oil from minimum to maximum or any setting in between, determined by where you set it, calibrated from off through 1 to 6.

2. Fully clockwise turns the appliance off,

3. Setting No 1 is the minimum

4. Setting No 6 is the maximum

3. WATER TEMPERATURE CONTROL KNOB

3-1. Also controls the flow of oil but this control is automatic and different to the oil flow control knob as it is related to the water temperature.

8-3 Extinguishing the Burner

1. Shutting the burners off is a very simple manoeuvre.

2. Turn the oil flow control knob FULLY in a clockwise direction until you feel it stop in its off position.

3. After a few minutes, the flame will die down and eventually extinguish itself.

Do not touch the appliance or burner until it has completely cooled down.

NEVER TRY TO RE LIGHT A HOT BURNER; MAKE SURE THAT THE BURNER IS COMPLETELY COOLED DOWN BEFORE RE LIGHTING.

DO NOT TURN OIL ON UNDER ANY CIRCUMSTANCES WHILST THE APPLIANCE IS STIL HOT OR WARM.

9. General Servicing Reqts

1.Servicing should be carried out as per the **service schedule provided with the appliance literature.**

9-1 Every 8 Weeks

9-1-1. Examine the Upper and Lower Catalysers

9-1-2. Clean the internal base of the pot

Clean the burner completely by removing all the inner components as follows,

Remove the upper catalyser and ring.

Remove the lower catalyser.

Note there are different types of catalyser; make sure that you order the correct one.

On Socomef burners there is a single catalyser.

Using a putty knife scrape the bottom of the pot clean and remove all carbon build up around the oil inlet.

Vac all the debris away.

Reassemble in the reverse order.

9-2 Every 24 weeks

9-2-1. Descalling Device

Check, clean and adjust the oil inlet descalling device.

Tighten the descaler gland nut and descale the oil inlet.

The descalling device is screwed directly into the vaporising pot.

It comprises of a cast brass tee piece into which is fitted a descalling rod sealed via a compression nut and small tubular gasket.

Oil enters the tee piece from a feed pipe connected directly to the outlet of the oil control valve.

Oil is fed to the pot from the valve, through the interconnecting feed pipe.

During normal running carbon deposits will build up in the bottom of the pot at the outlet side of the descalling device.

To keep the oil flowing freely into the pot the outlet must be de-scaled regularly and so to do this it is necessary operate the descalling lever by turning it completely two or three times, as you are rotating gently pull it out about 6mm (1/4") and then push it back to its start position.

(There should be a slight frictional resistance to turning; if it is loose the compression nut must be tightened slightly.)

If it is not possible by tightening the nut to establish a slight frictional resistance to turning, the internal tubular seal must be replaced.

Do not operate the appliance unless the descalling device is correctly maintained as described above.

There are occasions where burners are run under high flue vacuum conditions where carbon deposits can only be removed from within the tee piece by physically removing it completely from the pot, to allow access for descalling.

9-2-2. SITE GLASS

Where site glasses are fitted make sure that they are lightly cleaned.

9-3 EVERY YEAR

9-3-1. BAROMETRIC DAMPERS – CHECK FUNCTION

1. The barometric damper must be cleaned to remove any build up of dust and checked to make sure that it swings freely and is correctly adjusted.

2. The damper will only swing open under conditions where the maximum chimney vacuum is exceeded, normally this will be anything over .05"-.06" W.G.

3. At any vacuum below this figure the damper should be in a closed position.

Apply WD40 to the spindle tips.

9-3-2. CHECK IF THE HOLES IN THE POT ARE FREE FROM OBSTRUCTIONS

1. Each year the holes in the outer surface of the pot should be checked to make sure that they are not blocked,

2. Because of the running temperature of the pot it is unlikely that they will be blocked with hair or dust, however if the burner has been running sooty, it is possible that there could be some carboning or rust build up particularly around the bottom of the pot.

9-3-3. OIL FEED PIPE

Remove and clean out the oil supply pipe from the oil control valve to the descalling device.

9-3-4. Check that the Oil Flows Freely into the Pot

1. After servicing carry out a visual check to make sure that the oil is flowing freely into the pot.

Remove all the internals from the pot.

2. Turn the oil on to mini and look into the pot to make sure that the oil is flowing freely.

3. Remove any excess oil and leave the pot dry.

9-3-5. CHECK FOR Good Ignition

1. After carrying out a service test fire the appliance to make sure that it lights easily.

9-3-6.Oil Tank, Valve Filters and Line

1. Check that the Isolation Valve is Easily Accessible

9-3-7. Check the action of the KBB fire safety valve

(OFTEC OFS E101)

1. To check the action of the KBB fire valve carefully heat up the bulb and make sure that the valve shuts off.

2. Allow the bulb to cool down and then reset it ready for use.

9-3-8. Flue

1. Check flue and chimney condition and performance

9-3-9. Ventilation

1. Check that all purpose-designed ventilators are functioning correctly.

9-3-10. Baffle system

Check that the baffle system is not damaged or distorted, replace as required.

9-3-11. Insulation boards

Check that the insulation boards are in good condition, replace as required.

9-3-12. Burner Body and Catalysers.

Check that the base of the burner is not distorted or split, replace as required.

9-4 Every three years.

9-4-1. Clean the filter in the Oil Control Valve

10. Fault Finding

To assist with servicing and fault finding we categorise problems under the headings listed.

10-1 The Fuel

Check that there is no contamination.

Check that the fuel is the correct type and quality.

10-2 The Chimney

The chimney can cause a variety of problems which are generally caused by the effects of either excessive, inadequate or fluctuating vacuum affected by

An unusual wind condition

Dampers jammed or stuck open.

Obstruction in the chimney causing a loss of vacuum

Internal Appliance seals need renewing.

Pot to closure plate seal, damaged.

10-3 Lack of servicing

Burner choked with carbon scale.

See Burner Quickly carbons up.

10-4 Incorrect Commissioning

Commissioning or lack of it is the biggest single problem associated with alleged faults on vaporising conversions.

See commissioning for further info.

10-5 Oil Will not Enter the Pot

NOTE.

ON NEW INSTALLATIONS, IT IS NOT UNUSUAL FOR AN AIR BUBBLE TO RESTRICT THE FLOW OF OIL THROUGH THE METERING STEM IN THE OIL CONTROL VALVE.

TO CURE THIS PROBLEM GENTLY TAP THE VALVE WITH A PLASTIC HANDLED SCREWDRIVER OR AGITATE THE OIL IN THE FLOAT CHAMBER TO TRY AND BREAK THE MENISCUS LOCK CREATED BY THE AIR BUBBLE.

On existing installations the oil supply can be restricted by carbon in the descaler as detailed in the previous section.

1. Is there oil in the fuel tank?
2. Has the fire valve tripped?
3. Has the isolation valve been accidentally turned off?
4. Is the oil turned on at the oil flow control knob on the valve?
2. Has the level of the oil valve been disturbed?
3. The oil level mark on the side of the oil control valve should be set at 20mm from the bottom of the pot, check this out using a rule or height gauge.
6. Is the oil feed pipe from the valve to the pot blocked? (Unlikely)?
7. Check that the safety cut out lever has not been accidentally shut off.
8. If it is not possible to reset the safety cut off lever this would indicate that oil has flooded into the second float chamber.

9. (OCI VALVE)

In case of a failure of the first float, the second float chamber catches the excess oil and causes the second float to rise, this trips the safety cut out lever, making it impossible to reset, until the excess oil has been removed from the safety float chamber.

10.Tripping can occur if a full oil control valve is disturbed causing the secondary float chamber to flood.

11. To deflood the second float chamber remove the aluminium top plate on the valve and depress the second float until adequate oil is displaced to allow the trip lever to be reset.

10-6 Burner Does Not Light Easily

Ignition requires fuel and air plus heat, all in the right quantities

If the oil is in the right place, which is at the bottom of the lighting port tube, and there is sufficient chimney vacuum to pull an adequate amount of air through the burner, it will light normally if our instructions on lighting are followed.

Where short un-insulated flues are used or where chimney's are cold and have not been used for some time, air will not be drawn into the burner and the flame will self extinguish because of the lack of oxygen to support the combustion process occurring.

1. Check the level of the bottom of the pot and make sure that the appliance or burner is levelled so that the oil flows very slightly towards the lighting port.

2. Check the chimney vacuum cold.

3. Check that all the seals in the stove are sound.

4. Check that the swinging dampers are not jammed open.

5. Check that the oil is flowing freely into the pot.

10-7 Check that the Oil is in the Correct Place

1. Make sure that when the oil first runs into the pot, it is not running away from the oil inlet.
2. It should gather in a small pool around the oil inlet at the bottom of the lighting tube, if it does not do so, level the burner up until it does.
3. When you are happy that the oil pool is forming in the correct position, the burner will light easily and not be prone to ignition flair ups.

10-8 Burner Flares Up During Ignition

1. If the burner flares up during the ignition cycle this can be caused by allowing too much fuel into the pot before the flame has had the time to come up to vaporisation temperature. Take care not to allow this to happen by following our lighting instructions printed in the conversion technical and user booklets.
2. The other cause of this is the burner being out of level and the fuel not running into the correct position in the pot, which is towards the lighting port. This situation means that the base of the burner will be flooded with excess oil before the lighting process can begin. To re establish the correct levels can be a time consuming job and in many cases result in the whole of the conversion being stripped out and re fitted.

10-9 Burner Quickly Carbons Up

This situation occurs mainly when burners are run on 35-second diesel oil.

There will be a progressive build up of carbon in the bottom of the pot and around the inlet port of the burner, to deal with this a considerable amount of service work and severe descalling is required.

To help understand the reasons behind this situation and allow the service engineer to take adequate preventative measures we take time in the following text to detail the oil flow process into the burner.

1-1 Oil flows into the pot through the brass adaptor called the descalling device located at the base of the pot.

1-2 Through the centre of the descalling device is a round metal rod called a descalling lever?

1-3 When the decaling lever is rotated it is so designed to remove some of the carbon, which builds up on the inside bore of the device.

2. Oil flows into the pot via gravity with very little head pressure and so the slightest build up of carbon around the descaler will cause a resistance to the flow of oil.

3. As stated earlier the burner needs a minimum flow of oil to generate enough heat to keep it up to its critical vaporizing temperature.

CORRECT LOW FIRE SETTING

3-1 The critical vaporizing temperature is that at which the burner is hot enough to turn the oil into gas indicated by the presence of blue flame combustion.

4. The oil flow setting on low fire is deliberately set higher than is required for two reasons -:

To allow the burner a margin of excess to compensate for the progressive build up of carbon and subsequent progressive reduction of oil flow.

To give the flame enough energy to take the burner through the critical vaporising temperature barrier.

If the oil flow into the burner is allowed to reduce to a level lower than that required to keep the burner at or above the critical vaporising temperature, the burner can no longer do what it was designed to do and as a consequence oil just burns at a much lower temperature.

This will result in -:

Smoke issues from the chimney

The burner soot's and carbons up.

The appliance soot's up.

The chimney soot's up.

The flue ways soot up.

The whole lot must then be thoroughly cleaned before the stove will operate properly again.

10-11 CLEANING PROCEDURE

Before starting make sure that you have dustsheets down and plenty of tissue handy and wear suitable protective clothing.

Observe Good Health and Safety Routines (Suitable gloves and mask,)

1.Remove the oil feed pipe in between the oil control valve and the descalling device.

2. Unscrew the descalling device from the pot and dismantle it making sure that every scrap of carbon is removed from the inside the descaler body and the descalling lever.

3. Check the gap between the inner and outer skins of the burner pot at the bottom of the pot and thoroughly clean the annulus to remove every scrap of carbon build up.

(Use a mirror on a stick to view the carbon)

4. Clean the upper and lower catalysers with wire wool and a soft brush

5. Clean the flame ring with wire wool and a soft brush

6. Clean the appliance internals with a soft brush (if there is a thick coating of soot or scale on the stove it may be necessary to use a scraper tool to remove it)

7. Check that the chimney is clean.

8. Check that your oil supply tank is not water contaminated by flushing a sample of oil into a settlement jar.

9. Clean or change all oil filters and water traps.

12. Drain the oil control valve using the drain screw.

13. Remove and clean the internal filter in the oil control valve.

14. Brush all dust from the appliance.

15. Vac and clean up,

16. Check that oil does not leak from the pot, valve, and descalling device or pipe work.

10-12 Oil Smells

1. Carry out a visual check on all joints for any leaks.
2. Check that the descalling lever packing gland nut is adjusted.
3. If there is a slight lingering smell with no obvious visual signs of a leak, this will be attributable to the descalling lever packing gland nut requiring adjustment or possibly a new seal.

10-13 Operating Flow Rates

Flow rates are shown in cc per minute on the data plate of the valve.

2. To achieve optimum burner performance at these flow rates you will need to have matching flue vacuums as stated.

If the chimney does not generate enough vacuum the flow rates will have to be adjusted so that the burner maintains equilibrium, i.e. blue flame combustion.

(Lowering the flow rate will result in lower output from the appliance.)

10-14 Flooded Oil Control Valve

See "Oil Will Not Enter the Pot".

10-15 De-Flooding a Flooded Pot

If the pot has become flooded with oil proceed as follows: -

1. Wear plastic gloves do not allow fuel oil to contact your skin, if it does wash off immediately with soap and warm water.

2. You will need a plastic bag and a small sponge, remove the coal kit, upper catalyser and ring and the lower catalyser to give clear access to the base of the pot.

3. Sponge out the fuel and squeeze the sponge into the plastic bag, (it helps to keep drips to a minimum if the bag is put inside the stove) when all the oil has been sponged from the stove it will be safe to re assemble and re-ignite.

DO NOT ATTEMPT TO BURN OFF A FLOODED POT

Never try to ignite a flooded pot, this is very dangerous procedure and can result in a serious fire.

10-16 Racing

1. The term racing is used to describe audible vibrations, generated by the flame and caused by allowing excessive oil to build up in the bottom of the pot too quickly during the ignition process.

2. Turn the oil flow off until the burner has settled down into a steady burn rate.

3. Turn the fuel on again but don't let the flame go out, otherwise the burner **MUST** be allowed to cool down fully before a re ignition is attempted.

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