SEPTEMBER 1975

VULCAN OIL HEATING

SERVICE INSTRUCTIONS

MARK 1 SERIES HEATERS

"HYDRAFLAME"

Models

301	302	–	1964
301A	302A	–	1965-68

MARK 1 SERIES OIL HEATERS

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TO BREAKDOWN HEATER INTO MAJOR COMPONENTS

MARK 1 SERIES

BREAKDOWN A

1. Remove door cover by lifting and pulling forward.
2. Remove door by undoing two large brass nuts (1964 models) or four large hexagon nuts (1965 - 68 series).
3. Remove front frame assembly by removing two screws "H" Fig. 1, and pulling frame forward at bottom and down.
4. Remove nosepiece by removing surround which will expose the eight 5/32" Whit. screws holding it to case.

CUTAWAY ILLUSTRATION MODEL 302 INBUILT
MECHANICAL DETAIL IS THE SAME FOR MODELS 301 CONSOLE, 302A AND 301A

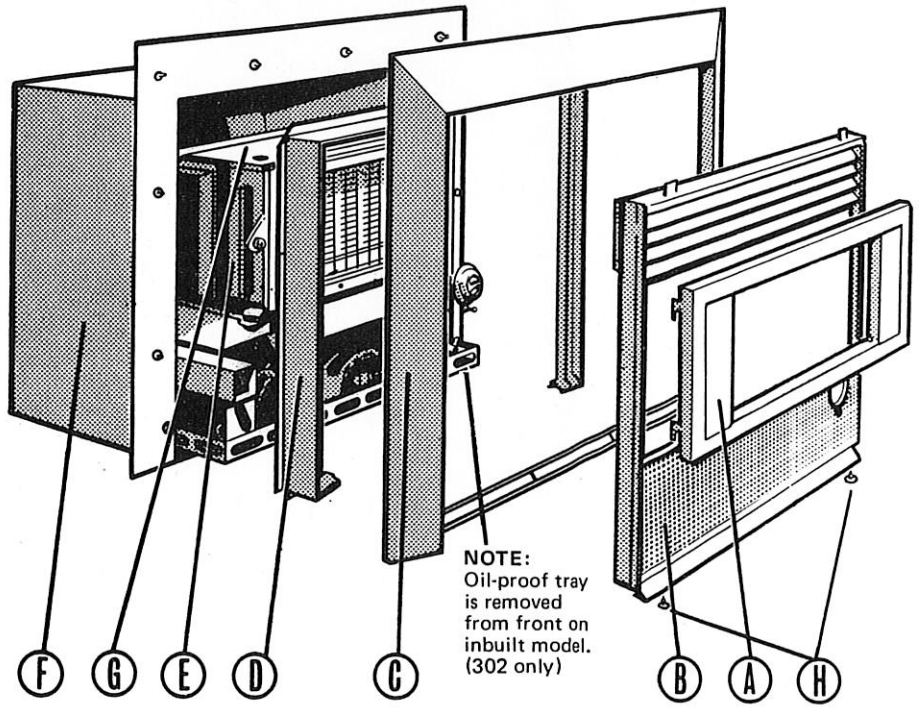


FIG. 1

- (A) WINDOW PANEL
- (B) COMPLETE FRONT ASSEMBLY
- (C) SURROUND
- (D) FRONT NOSE
- (E) INTERIOR ASSEMBLY
- (F) OUTER CASE
- (G) DRAUGHT TESTING HOLE
- (H) FRONT GRILLE RETAINING SCREWS

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

BREAKDOWN B

To Remove Burner

1. Remove front frame and nosepiece (steps 3 and 4, Breakdown "A").
2. Remove door (step 2, Breakdown "A").
3. Remove front heat shield and switch bar assembly.
4. Remove heat shields. [Figs. 2 and 3]
5. Remove indicator light box [Fig. 2] and radiants (handle with care).
6. Disconnect ignition element wires to burner.
7. Disconnect elements cut-out switch (models 301 and 302) or move switch to left, out of clamp (models 301 A and 302 A).
8. Disconnect earth braid to burner.
9. Disconnect valve to burner oil line at burner centre.
10. Remove 4 x ¼" Whit. Hex. bolts holding burner top to cast iron separator plate (301, 302 models)
    OR
    Remove screw holding element heat shield to combustion chamber extension.
11. Burner may now be withdrawn forward.

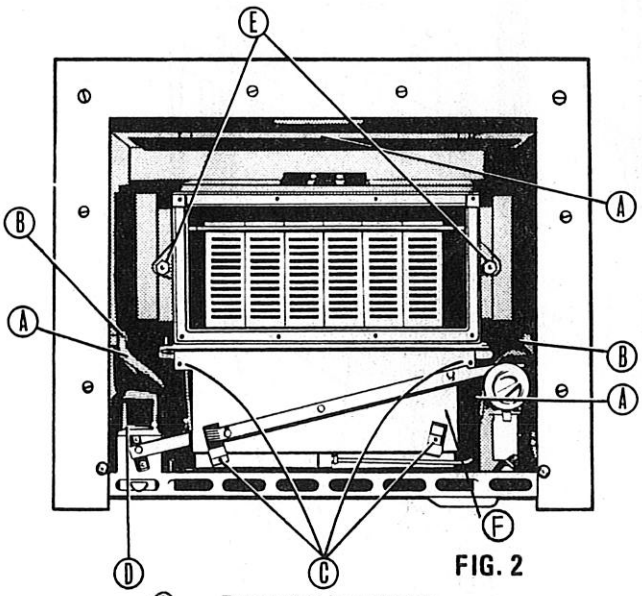


FIG. 2

Ⓐ Removable heat shields
Ⓑ Baffle retaining screws
Ⓒ Ignition bar assembly retaining screws
Ⓓ Indicator light box retaining screw
Ⓔ Window assembly retaining nuts
Ⓕ Front heat shield and switch bar assembly

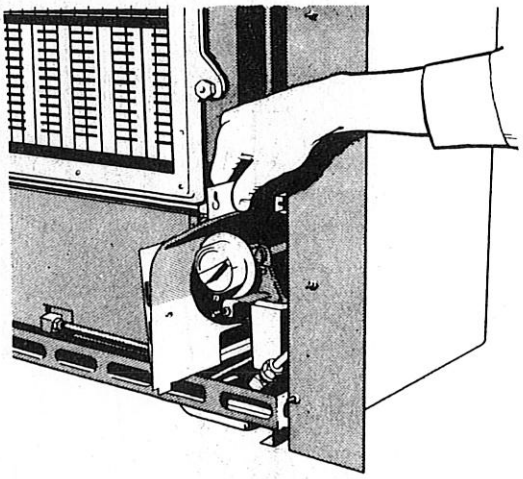


FIG. 3

REMOVAL OF SIDE HEAT SHIELDS

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

BREAKDOWN C

To Remove Blower Assembly (Inbuilt Models)

1. Remove front frame assembly (Breakdown "A", Step 3).
2. Remove heat shields (Breakdown "B", Steps 3 and 4).
3. For Model 302A
   (a) Remove burner (Breakdown "B").
   (b) Remove two screws holding access plate behind burner.
   (c) Remove access plate.
   (d) Disconnect fan wires (single speed) or plug and earth (dual speed models).
   (e) Move fan mounting sideways and remove fan through aperture.
4. For Model 302
   (a) Turn off oil at tank, disconnect line at heater valve and remove valve to avoid oil spillage.
   (b) Support flue by fitting PK screw through case flange into flue.
   (c) Tilt heater up at front and pull unit forward from case. (N.B. If unit wired-in power supply may require disconnection.)
   (d) Remove fan off mountings.
   (e) Disconnect wires and remove fan.

To Remove Blower Assembly (Console Models)

1. Remove case back (Model 301) toward rear (at bottom to clear fan).
2. Remove indicator light box. (Breakdown "B", Fig. 2 – D)
3. Disconnect fan wiring.
4. Remove fan from rear.
5. Remove screws (2 each side) holding bottom mesh or fan shield to case (Model 301A).

   Follow steps 2, 3 and 4, this section.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

BREAKDOWN D

To Remove Oil Control Valve Assembly

1. Remove front frame.
2. Remove door (301A and 302A only).
3. Remove burner front heat shield and switch bar assembly.
4. Remove valve heat shields (models 301 and 302). See Fig.3.
5. Turn off oil and disconnect at heater valve.
6. Disconnect valve to burner pipe at burner.
7. Loosen two screws holding valve base plate to chassis or one horizontal screw holding plate against rear.
8. LIFT valve assembly at front and remove forward.

NOTE:

When re-assembling ensure rear of valve mounting plate is engaged in bracket and draught spindle crank is engaged in quadrant slot.

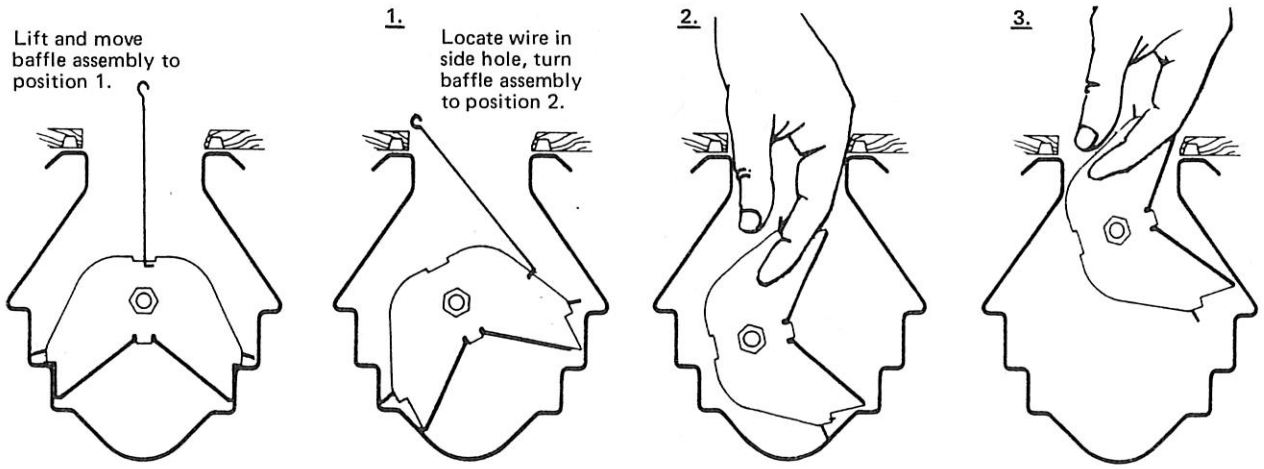
MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

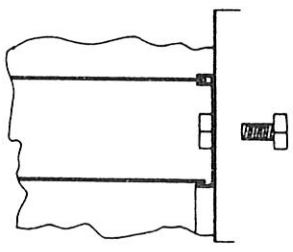
BURNER SERVICE – 301 and 302 (1964 Models)

(For 301A and 302A Refer Page 14)

1. Remove burner from heater (refer Breakdown "B").
2. Remove ignition element assembly by undoing three brass screws and prising off through slot in cover (models 301 and 302 only).
3. Remove two ¼" set screws (one per side) and, using wire hook in centre side hole of top baffle or reflector, lift assembly (top and bottom baffle plus end caps) on side and remove through slot in top of burner.
   NOTE: This applies only to models 301 and 302. [Fig. 4]
4. Slide top baffle to left and bottom baffle to right to clear holding clips.
5. Using wire hook in centre side hole, turn top baffle on side and remove through burner top.
6. Using wire hook remove bottom baffle through burner top.

REMOVING THE BAFFLES (MODELS 301 and 302 – 1964 Series)





Two end caps, top and bottom baffles placed into burner as an assembly.

End caps then held to burner ends by bolts.

When replacing the burner baffles and end caps, it is important that the end caps are pushed firmly downwards when the end bolts are tightened.

NOTE: **Glow plug assembly must be removed prior to removing baffles.**

1/8" Diam. wire for extraction.

FIG. 4

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

ELECTRICAL SYSTEM

CIRCUIT DIAGRAM FOR 301A AND 302A

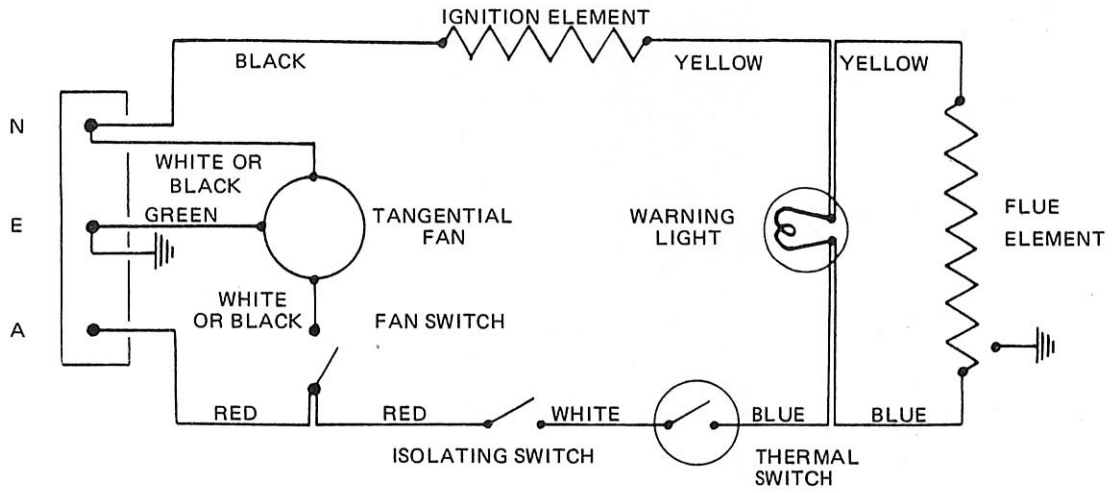


FIG. 5

TO CHECK CIRCUIT:

Switch off power, disconnect neutral wire at terminal block. Switch on power again.

CAREFULLY touch one test lamp probe (or load) to earth connection on terminal block. Trace continuity by checking each component with the other test lamp probe.

When test lamp does not light a break in continuity BEFORE that component is indicated.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

TO REMOVE FLUE ELEMENT

Turn off power to unit.

1. Repeat step 3 as in Breakdown "A".
2. Repeat step 4 as in Breakdown "B". (Element end only)
3. Remove top air guide from above combustion chamber by –
   Lifting the back clear of heat exchanger then sliding forward and allowing air guide front to drop over the front of unit. Then pull forward.
4. Undo wires to flue element.
5. ★Open holding clips on element (6 clips) and pull element clear of clips by moving element to the back.
6. Lift element loop up and forward and pull gently clear of elbow and flue.

★ Note: Later production utilised saddles screwed to heat exchanger.

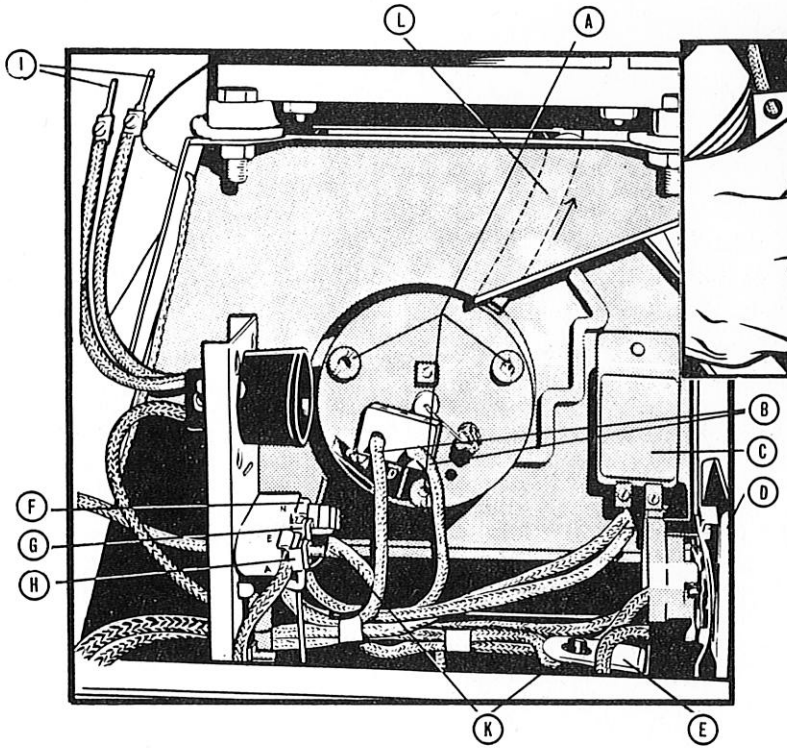
TO REMOVE IGNITION ELEMENT (301 and 302 – 1964 Series)

1. Remove front frame, burner front heat shield and switch bar assembly.
   Pilot Globe tube (or electrics heat shield if fitted). [See Breakdowns "A" and "B"]
2. Open sliding grate on element cover (or remove tape if fitted).
3. Remove breather tube between element cover and combustion chamber.
4. Insert large screwdriver in element case slot and lever element assembly off after removing three brass nuts. [Fig. 6]

For 301A and 302A refer page 15, Section C.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

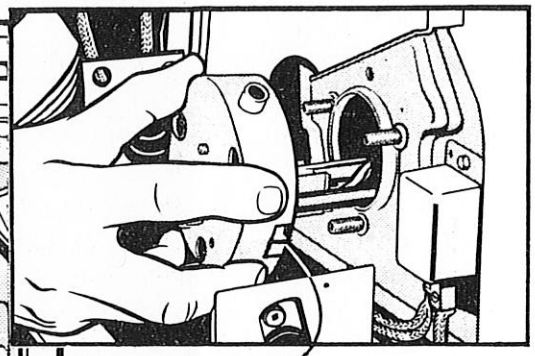
FIG. 6



(A) IGNITION ASSEMBLY RETAINING SCREWS
(B) IGNITION WIRING TERMINALS
(C) AUTOMATIC CUT-OUT SWITCH
(D) IGNITION "ON-OFF" SWITCH
(E) TWIN ROTOR "ON-OFF" SWITCH
(F) NEUTRAL TERMINAL
(G) EARTH TERMINAL
(H) ACTIVE TERMINAL
(J) DRAUGHT ELEMENT TERMINALS
(K) TWIN ROTOR WIRING TERMINALS
(L) IGNITION "BREATHER" TUBE

NOTE: Use 'Miscolute' to reseal Element Assembly to burner.

FIG. 7



Sliding gate (for removal of ignition assembly).

Model 302 Inbuilt

This model has an electrical connection terminal on the left-hand side, which is exposed once the baffles are removed (see Figure 4). It is mandatory that the active and neutral connections are correctly made. The electrician must install an isolating switch in the proximity of the heater, into which the inbuilt heater is wired.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

TO REMOVE DRAUGHT BREAKER

301 Console Model

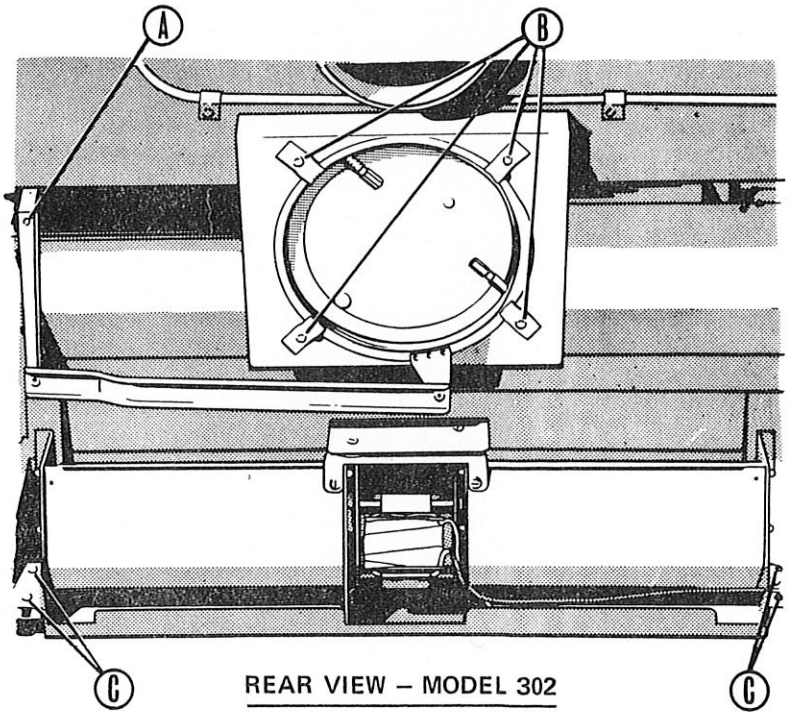
1. Move heater forward.
2. Remove back plate. Draught breaker assembly is now readily removed.

302 Inbuilt Model

1. Remove front frame (Breakdown "A", item 3).
2. Remove heat shields from valve side.
3. Remove top air guide.
4. Put hand over top of combustion chamber and with pair of pliers remove split pin (A), Fig. 8, holding draught breaker operating arm to combustion chamber.
5. Putting arm over top of burner, remove two top screws and clips (Fig. 8), holding draught breaker.
6. Loosen two bottom screws and withdraw draught breaker assembly over top of combustion chamber.

   Note: There is no need to remove heater from case to service or replace draught breaker.

FIG. 8



REAR VIEW – MODEL 302

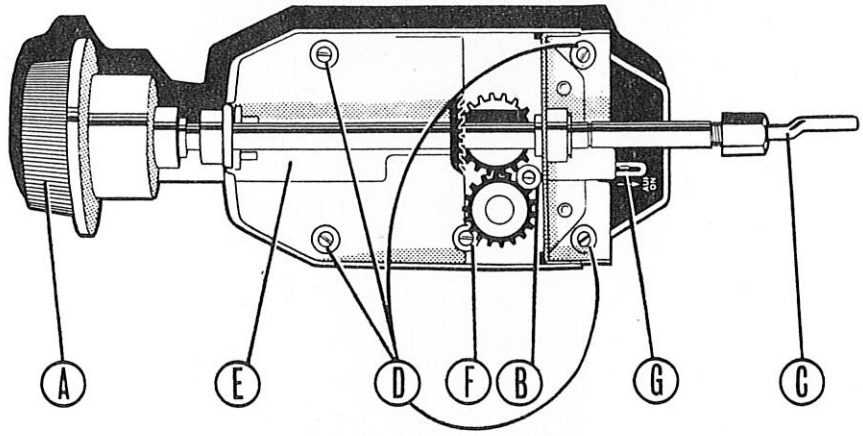
MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

OIL CONTROL VALVE

Showing ONLY adjustments to be made in field and ONLY IF REQUIRED.

INAL VALVE used on 301, 302, early 301A and 302A

FIG. 9



(A) OIL ADJUSTMENT KNOB.
(B) "MAXIMUM" OIL FLOW ADJUSTMENT SCREW.
(C) AIR REGULATION SHAFT.
(D) OIL CONTROL COVER RETAINING SCREWS.
(E) OIL CONTROL "ON-OFF" LEVER OPERATING BAR.
(F) "MINIMUM" OIL FLOW ADJUSTMENT SCREW.
(G) OIL CONTROL "ON-OFF" LEVER.

TO ADJUST HIGH AND LOW FIRE ON INAL VALVE

Before making any adjustments to valve, ensure burner has been cleaned and that there are no oil leaks.

High Fire

1. After heater has stabilised on full fire take draught reading, which should be .07" W.G.
2. Adjust screw (B) to give flame pattern of blue flames right across top row of holes, with dancing yellow tips at least 1" long.
   (a) Excessive yellow with radiants sooting — indicates need to reduce high fire screw.
   (b) Lack of yellow tips — indicates need to increase high fire screw.

   Note: **Clockwise reduces oil flow, anti-clockwise increases oil flow.**

Low Fire

1. Turn controls to lowest position and allow at least fifteen minutes for flame to stabilise. Adjust draught with air control knob to .02" W.G. Use draught meter.
2. Adjust screw (F) to give yellow tipped flame level with, but not coming out of top row of holes.

   Note: **Clockwise reduces oil flow, anti-clockwise increases oil flow.**

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

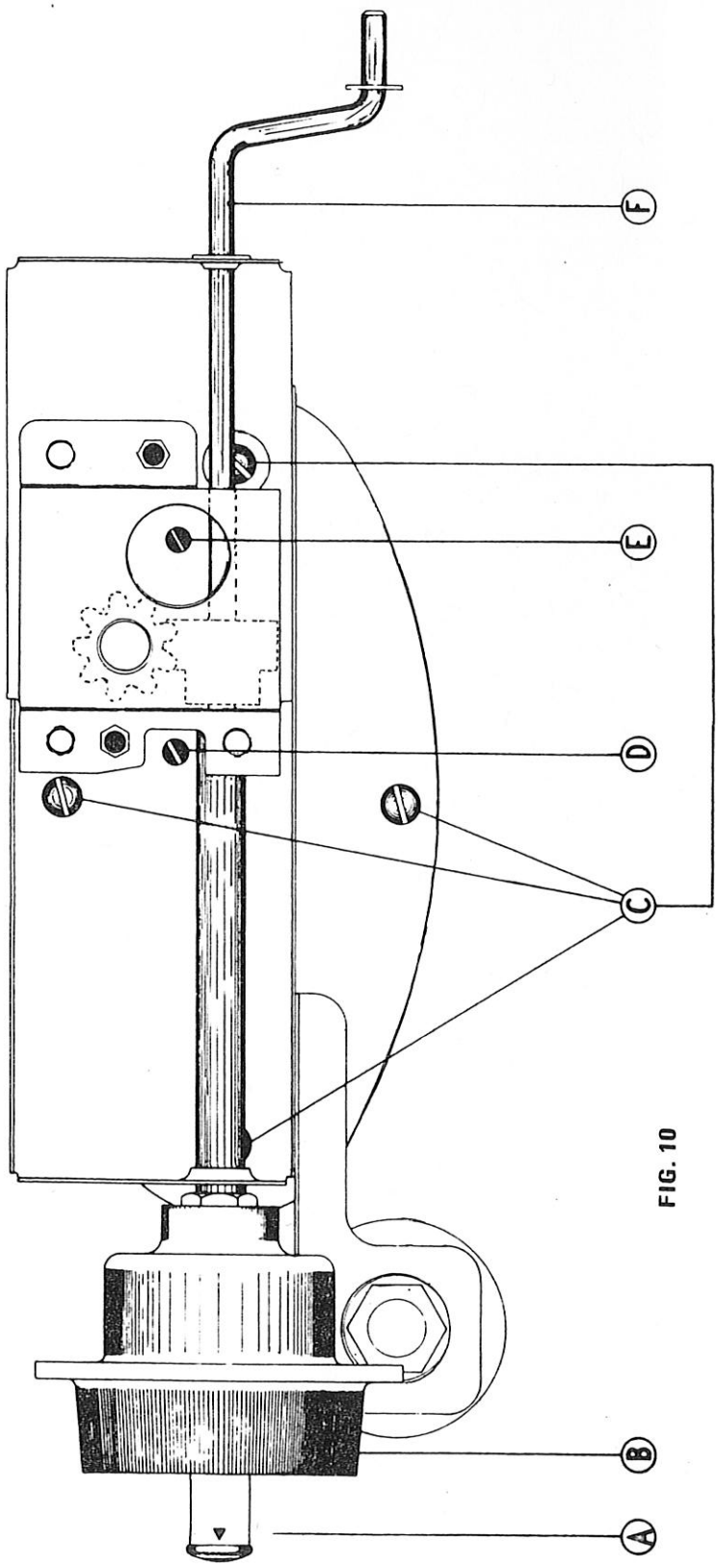


FIG. 10

A.P. VALVE

A – OIL CONTROL "ON-OFF" BUTTON
B – OIL ADJUSTMENT KNOB
C – OIL CONTROL COVER RETAINING SCREWS
D – LOW FIRE INCREASE ADJUSTMENT SCREW
E – HIGH FIRE DECREASE ADJUSTMENT SCREW
F – AIR REGULATION SHAFT

SERVICING INSTRUCTIONS FOR A.P. OIL CONTROL VALVE

During April 1966, Hydraflame oil heaters were equipped with A.P. valves. These are interchangeable with the Inal valve, and for some time heaters were manufactured with either type.

The A.P. valve operates on similar principles to the Inal, using a primary and secondary float system with high and low fire adjusting screws.

It is important that every Installer and Serviceman carefully read the following instructions:

TO ADJUST HIGH AND LOW FIRE SETTINGS ON A.P. VALVE

Before attempting to carry out any valve adjustment, burner should be checked for oil leaks, carbon build-up and clean air holes, as it is impossible to correctly adjust valve unless the burner is right.

IMPORTANT: The high and low fire adjusting screws are only for **fine** adjustment. Maladjustment of the low fire screw will upset high fire adjustment and void guaranty on valve.

A. HIGH FIRE

Make sure heater has been burning long enough on high fire (oil setting 6), to heat flue system and properly stabilise. Measure draught with draught meter and set on .07". Adjust screw (E) to give flame pattern of blue flames right across top row of holes with dancing yellow tips at least 1" long.

Turning adjusting screw clockwise reduces oil flow, anti-clockwise increases flow.

Maximum flow rate **cannot** be increased.

Adjustments should be made not more than half a turn at a time, allowing enough time for burner to stabilise between each adjustment.

B. LOW FIRE

Oil setting on 1 – allow burner to stabilise. Check draught with draught meter, make sure draught is .02" maximum with air control turned down as far as it will go. (No. 1 setting)

Yellow tips on flame should now be level with top row of holes. Adjust by turning adjusting screw (D).

Turning adjusting screw clockwise increases oil flow, anti-clockwise decreases oil flow. Minimum flow rate of 5 ccs. **cannot** be decreased.

IMPORTANT: Make sure draught breaker is operating freely, by checking with draught meter.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

SPECIAL POINTS TO OBSERVE

1. RESET

The A.P. valve reset button works in the **opposite** way to the Inal valve.

With A.P. valve { **PULL OUT TO RESET**
PUSH IN TO SHUT OFF

The reset button is not tripped by the metering stem when the oil is turned off at the heater control. The reset button now has to be pushed in and tripped manually every time the heater is turned off.

2. ADJUSTMENTS

High Fire : Cannot be increased above set maximum flow rate.
Turn screw CLOCKWISE to DECREASE.

Low Fire : Can be adjusted either way, but **maladjustment will throw high fire adjustment out.**

GENERAL

(a) Only turn adjusting screws quarter turn at a time and allow flame to stabilise.

(b) The A.P. valve is painted inside with a special paint to retard 'creepage' of oil. Oil will **not** creep on a **dry** surface, only when walls of valve have been splashed with oil.

This can occur when a tripped (flooded) valve is cleared by repeated operation of manual reset button.

Whenever a flooded valve is cleared in this way, it **must** be **serviced** shortly afterwards, as follows, otherwise it could trip out again through oil creepage.

(i) Dismantle and inspect valve for foreign matter or maladjustment.
(ii) Clean out valve thoroughly with turpentine or petrol.
(iii) Dry out valve thoroughly and re-assemble.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

INSTRUCTIONS FOR DISMANTLING COMPONENTS – Models 301A and 302A

For Models 301 and 302 Refer Pages 1–10

A. BAFFLES OUT OF BURNER

1. Remove front frame assembly by loosening two screws under bottom nose, slide mesh bottom forward and then pull down.
2. Remove door by undoing four Hexagon nuts and pulling forward.
3. Remove radiants.
4. Remove top radiant support bar.
5. Remove bottom radiant support bar.
6. Remove left and right baffle end covers.
7. Insert special offset baffle tool or large screwdriver into top right hand slot of top baffle and centre slot of bottom baffle and move screwdriver handle from right to left, this will bring baffle out from the holding lugs.
8. With wire hook in top baffle air holes, carefully withdraw top baffle.
   With wire hook in bottom baffle slot, carefully pull bottom baffle out.

B. TAKING BURNER OUT

1. Repeat steps 1 and 2 as in item "A". (Radiants may be left in position.)
2. Remove self-tappers from isolating switch-bar asembly, lift switch-bar over control knob with right hand forefinger, and gently pull forward.
3. Remove light tube by removing self-tapper above fan and isolating switch, then pull light tube forward and up.
4. Remove thermal switch (otter control) by loosening holding clamp with a screwdriver (this is located on the left hand front of burner) and pull thermal switch out to the left. Do not lose space washer.
5. Remove the ignition heat shield by undoing self-tapper above the thermal switch. Do not attempt to pull this heat shield out, as it will come out with the burner.
6. Remove "quick-connect" terminals from ignition element on left hand end of burner.
7. Undo oil line from burner, located centre front of burner. Then gently pull oil line and nut free of nipple on burner elbow.
8. Gently remove burner by easing it forward in slides, using one hand on each side of burner.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

C. REMOVE IGNITION ELEMENT

1. Repeat steps 1 – 8 as in "B".
2. Repeat steps 6 – 8 as in "A".
3. Remove heat shield from left hand of burner.
4. Remove Hexagon nuts from element with suitable spanner. Element can now be taken out from inside the burner.

D. TAKING FAN OUT (INBUILT)

1. Repeat steps 1 – 8 as in "B".
2. Undo two self-tappers on back heat shield panel located behind burner. Then push panel down, pull top forward and up to remove.
3. Disconnect fan wires.
4. Roll fan spring on left hand side out and down from retaining bracket.
5. Carefully move fan to left and back; this will disengage bracket and spring on right hand side.
6. Turn fan assembly so that rotors face upwards. This will protect them from damage, and bring right hand side of fan assembly through opening.

E. REMOVE VALVE TURN OFF OIL SUPPLY AT MAIN TANK

1. Repeat steps 1 – 2 as in "A".
2. Repeat steps 2 and 7 as in "B".
3. Undo oil supply line from tank, using **two** spanners (one to hold filter boss).
4. Loosen two holding screws, located under external filter.
5. Slide valve assembly forward then lift clear of holding screws and pull gently out.

F. OIL CONTROL KNOB

1. Repeat steps 1 – 2 as in "A".
2. Repeat step 2 as in "B".
3. Ease air control knob forward.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

F. OIL CONTROL KNOB (cont.)

4. With tube spanner remove brass holding nut.
5. Withdraw oil control knob and washer from shaft.

G. DOOR GLASS

1. Repeat steps 1 – 2 as in "A".
2. Remove four 5/32" square nuts from front of door.
3. Press gently on to 5/32" screws and lift out door frame clear.

H. OIL FILTER (EXTERNAL) TURN OFF OIL AT MAIN TANK

1. Repeat step 1 as in "A".
2. Repeat step 3 as in "E".
3. Undo Hexagon clamp nut at bottom of filter. (Inal valve)
4. If A.P. valve is fitted, valve must be removed to undo filter to valve connection.

I. REMOVE FAN ASSEMBLY FROM CONSOLE

1. Remove front frame assembly and light tube assembly in order to disconnect wires.
2. Undo two self-tappers from the bottom back corners of unit and remove mesh panels from both sides. (Later units have full metal panel over fan.)
3. Undo fan wire connections.
4. Roll fan spring on the left hand side out and down from the retaining bracket.
5. Withdraw the fan carefully out on the left hand side.

J. REMOVE FLUE ELEMENT FROM CONSOLE UNIT

1. Pull or swing unit clear of flue, if oil line allows sufficient movement.
   If not, turn off oil at tank, disconnect oil line and then pull unit forward of the flue to allow back of unit to be removed.
2. To remove back of unit undo four self-tappers on top of mesh. Loosen two self-tappers at top side (one on right hand side and one on left hand side).

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

J. REMOVE FLUE ELEMENT FROM CONSOLE UNIT (cont.)

3. Remove two self-tappers at the base of back panel (one on right hand side and one on left hand side).

4. Undo wires to flue flement.

5. Open holding clip on element (6 clips) and pull element clear of clips by moving element to the back.

NOTES ON THE OPERATION OF THE VULCAN HYDRAFLAME TRIPLE-STAGE BURNER

Correct burning can be ascertained visually and is not a matter of guess-work. When burned correctly, the Vulcan Hydraflame Triple-stage burner will remain remarkably free from carbon build-up.

It is important that the user understands how to correctly 'tune' the air and oil control knobs if he is to obtain correct burning and top efficiency throughout the operating range. For this reason, we make it part of the installer's job to carefully instruct the user in the correct operation of the heater.

HIGH FIRE

Note: Before adjusting the oil valve or servicing a Hydraflame, make sure that the heater has been on full fire for 30 minutes to allow the flue system to heat properly. Do not adjust the valve without checking the draught **first** with a Dwyer draught meter, to make sure that it measures .07".

(a) Blue flames must appear right across the top row of burner holes, **with yellow tips at least 1" long**. The best efficiency is reached when we have the highest possible yellow tip without introducing sooting, at .07" draught.

(b) Not all burners will have these yellow tips with complete evenness across the whole burner. Sometimes the tips will be higher in the centre or at the ends. This does not matter as long as it is not extreme.

(c) New burners have a tendency to "settle down" with the flame pattern becoming more regular after a few weeks.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

NOTES ON OPERATION (cont.)

High Fire (cont.)

(d) It is important that the air be controlled to eliminate red or purple flame, although extremely windy days will cause slight surges in up-draught with consequent tinges of redness, **occasionally.**

(e) Sometimes, the oil and air knob pointers will coincide at the correct flame pattern, **but this is not essential.** The main thing is that the flame picture looks right with the correct yellow tips.

LOW FIRE

(a) Allow 10 to 15 minutes for stabilisation after turning down.

(b) On a new installation or service call, make sure that the draught reading is not more than .02" when the air control is turned right down.

(c) We should see a flame dropped down off the top row of holes entirely. The yellow tip should be longer in the centre of the burner, reaching up to the top row of burner holes under the radiants.

(d) Too much air will result in the flame disappearing under the top baffle, making it cherry red.

TROUBLESHOOTING GUIDES

From the point of view of **thoroughness** and **timesaving,** it is essential to use a logical standard procedure. A haphazard approach to servicing or testing will result in unnecessary call-backs and service calls.

1. EXTERNAL INSPECTION

(a) **Check Cowl**

Before you enter a house, look up to see that correct cowl has been used and that it is above ridge and not in a likely pressure or down-draught zone.

Note: Make sure that you listen carefully to customer's complaint or query before you start work on the heater.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

TROUBLESHOOTING GUIDES (cont.)

External Inspection (cont.)

(b) Check Controls

On first approaching the heater, check that –

Oil Control (also switchbar mechanism)
Air Control
Fan and Switch

are all operating correctly.

2. OPERATING CHECK

Remove complete front assembly for access, and –

(a) Check unions for oil leaks.

(b) Check arrangement of all visible components.
Heat shields and air guides.
Fuel line and overflow.

(c) Check burner condition and clean if necessary.

(d) Check oil flow and if necessary replace filter.

(e) Check ignition cycle (make sure trip arm operating freely when oil control turned on).
Ignition time check.
Make sure thermal switch cuts out when burner warms up (light goes out).

(f) Test on high fire, and adjust if necessary – refer to pages 10 and 12.

(g) Test on low fire, and adjust if necessary – refer to pages 10 and 12.

REMEMBER!
Irregularity of flame picture may indicate presence of carbon in burner – it can be a waste of time to adjust valve **until after** burner has been cleaned out thoroughly.

(h) Check draught breaker response through range of control knob operation – use draught gauge.

NOTE:
On finishing operating check, turn heater off with fan running, for quick cooling of components.

Replace front and clean up.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS

TROUBLE SHOOTING CHART

FAILURE TO IGNITE AUTOMATICALLY

FAULT	REASON
No power supply to unit	NOTE: If indicator lamp on unit does not light up when switched on, then test circuit with test lamp or neon tester. (a) Blown fuse at switchboard, faulty isolating switch, faulty power point or open circuit in house wiring – call electrician. (b) Not plugged in (Console model) or not switched on at power point
Open circuit in heater electrical system	NOTE: Heater will not re-ignite automatically until cold. (a) Ignition bar sticking or not actuating On/Off switch correctly. (b) Faulty automatic cut-out switch. (c) Ignition assembly blown (this may be as a result of reversed active and neutral connections – either by wrong connection in installation or use of an extension lead or double adaptor). This applies to early models having separate glow-wire in addition to pre-heat loop. (d) Broken or loose wire in circuit. (e) Failure of sheathed burner element (mostly due to incorrect burning). (f) Failure of flue element.

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TROUBLE SHOOTING – FAILURE TO IGNITE AUTOMATICALLY (cont.)

FAULT	REASON
Fault in fuel supply system	(a) User has forgotten to press reset button. (b) Insufficient oil in storage tank, or tank turned off; or tank installed too low for gravity feed. (c) Low-fire adjustment on valve not set correctly. (d) Burner or valve not level. (e) Blockage in fuel line, or valve filter. (f) Air lock in fuel system.) If burner tilted to right – oil does not reach glow plug end. NOTE: If ignition indicator light comes on, then radiants should be lifted out to enable element ignition operation and oil flow to be inspected visually. Use torch and small mirror, or look down into burner by placing head inside window opening.
CAUSES OF INCORRECT BURNING	
Burner not level	Heater installed out of level, causing burner to be out of level.) In severe cases, flame pattern will be distinctly lop-sided. This must be corrected by levelling heater (using packing strips).
Valve not level	Same as for Burner (above)) This upsets flow-rate and must be corrected, as above.
Draught/Oil mixture wrong	(a) Oil and air knobs not used correctly by owner.) Some owners think that 'Oil' and 'Air' knobs must be always together – or they forget to 'tune' flame pattern correctly. (b) **Maximum** or **minimum** draught excessive – usually due to excessively long flue without correctly adjusted second draught-breaker.) Draught MUST be .07" on Full Fire and .02" maximum on Low, using draught meter after stabilising period. A second draught-breaker may be required where flue exceeds 18 feet.

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TROUBLE SHOOTING – CAUSES OF INCORRECT BURNING (cont.)

FAULT	REASON
Draught / Oil mixture wrong (cont.)	(c) Maximum draught insufficient – usually due to poor flue system.) This results in smoky yellow flame. **Measure** draught to be sure of .07".
	(d) Oil control valve not adjusted correctly to suit particular installation.) See section on testing and valve adjustment.
	(e) Air control not moving freely through complete range.) Check for variation of draught reading and flame picture when air control knob is turned right through range. (Reading should vary .02" to .07".)
	(f) Draught-breaker flap on unit stuck, or not operating freely in pivots.
	(g) Check door seal.) Easily detected by negative reading on draught meter – this can be dangerous and flue system **must** be altered.
	(h) Presence of down-draught or positive pressure.
Fault in burner section, 301, 302 1964 models. For 301A or 302A see "BURWOOD" details.	(a) Glow-plug (ignition) assembly sealing in burner. Use "Miscolute" for re-sealing.) Symptom is usually a red patch in flame at left hand end of burner.
	(b) Ignition assembly not seated correctly, e.g., element tilted upwards.
	(c) Baffles out of position or warped.) Must be firmly seated on clean carbon free surface.
	(d) Poor seal between burner and combustion chamber.) Symptom is red patch in flame pattern. This is very rare.
	(e) Accumulation of carbon in burner and/or burner inlet.) Must be removed after cause is remedied.) See instructions for removing/ cleaning burner.

MAKE ABSOLUTELY SURE HEATER IS DISCONNECTED FROM POWER BEFORE REMOVING OR REPLACING ANY COMPONENTS