

# SELECTOS

## GAS & OIL BURNERS

### INSTRUCTION MANUAL

for

SELECTOS D.42 OIL BURNER.

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**SELECTOS**  
Gas and Oil Burners

Selectos Burner Product Division  
NU-WAYLIMITED, P.O. Box 1, Vines Lane, Droitwich,  
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## 1. INSTALLATION.

The burner complies with the relevant requirements of BS.799 Part 3 and it is recommended that the installation of which it is part, should conform to good current practice as set out in the relevant BS Code of Practice for Oil Firing.

### 1.1. Pre-installation check.

Examine the burner for possible damage in transit and check by reference to Figs. 2 & 3 or 4 & 5.

#### 1.1.1. Nozzle size.

Check that the size of the nozzle is correct for the appliance to be fired.

#### 1.1.2. Draught tube.

Check that the identification letters on the burner nameplate are correct for the nozzle size.

#### 1.1.3. Flame ring location.

Check that the dimension from the front face of the flame ring to the end of the draught tube is as recommended.

#### 1.1.4. Air Shutter.

Set the air shutter to approximately half open.

### 1.2. Burner mounting.

The burner should be securely mounted on the appliance by means of the fixing flange and two M10 Studs x 25 mm long. A gasket is provided to minimise the transmission of heat and vibration.

### 1.3. Combustion chamber.

The dimensions of the combustion chamber should not be less than the minimum shown on Fig. 2.

No special refractory lining is required other than the front and rear walls indicated.

### 1.4. Oil supply connection.

Oil supply connections between the storage tank and the burner should be run in copper, steel or aluminium pipe. Galvanised pipes and fittings must not be used. All pipework and fittings must be oil tight and screwed joints should be made good with an oil resisting jointing compound.

The supply should terminate close to the burner with a valve and filter and approximately the last  $\frac{1}{2}$  m should be run in flexible pipe to facilitate moving the burner away from the appliance during major servicing of the latter.

/ Cont'd.....

The size and arrangement of the pipework will depend on the distance and height of the storage tank in relation to the burner.

1.4.1. Gravity feed supply.

Where the delivery connection on the storage tank is above the level of the burner pump inlet a single supply pipe may be used, arranged as shown in Fig. 6.

1.4.2. Suction lift supply.

Where the delivery connection on the storage tank is below the level of the burner pump inlet a two pipe system must be used, arranged as shown on Fig. 7/8/9/10, except for monotube pumps such as the MSLB032. Arrangements for converting pumps from single pipe to two pipe systems vary, consult the appropriate figure for the pump used or consult the pump manufacturer.

1.5. Electrical connection.

At least the last  $\frac{1}{2}$ m. of the main supply to the burner and also connections to a boiler thermostat, should be run in flexible conduit.

The connections should be in accordance with wiring diagram Fig. 11/12/13/14, and all wiring should conform to I.E.E. regulations.

An isolating switch should be fitted adjacent to the appliance, and the supply should be protected by a 10 amp fuse.

1.6. Ventilation.

To ensure an adequate supply of air for combustion the room in which the burner is installed should have some permanent ventilation in the order of 5.5 cm squared per kW (1 in. squared per 4000 Btu/h).

## 2. COMMISSIONING.

It is recommended that the burner should be put into operation by a competent engineer and that recognised combustion testing instruments should be used to enable the burner to be adjusted to the correct operating conditions. The normal procedure is as follows. (The number references relate to Fig. 1.)

### 2.1. Bleed air from oil supply.

#### 2.1.1. Single pipe system.

Disconnect flexible oil pipe at pump inlet, open stop valves slowly and run off some oil into a receptacle to establish an air free supply of oil to the pump. Re-make joint oil tight and leave valves open.

#### 2.1.2. Two pipe system.

Open all valves. The oil pump is self priming and air bleeding is automatic when the burner is subsequently started.

### 2.2. Fit pressure gauge.

Remove plug (2) from oil pump and fit pressure gauge with R 1/8 connection.

### 2.3. Set ancillary controls.

Check that any thermostats, time switches etc. are set so that the contacts are made, calling for the burner to be energised.

### 2.4. Switch on electricity.

Depending upon the type of control box fitted, the burner may start and ignite immediately or there may be a short delay of 7 - 15 seconds for pre-purge. Until all air from the oil pump is flushed out through the nozzle there may be some flame instability resulting in the burner 'locking-out' as indicated by the signal light (8) on the control box. In this event, wait two minutes then press the reset button (8) to re-start.

### 2.5. Vent oil pump.

Whilst the burner is running vent air from pump by slackening off the pressure gauge or bleed screw sufficient to allow air to bleed out. When bubble free oil seeps out re-tighten.

### 2.6. Adjust oil pressure.

If the pressure gauge is not indicating the desired reading (see Fig. 3 or 4) then adjust the pressure. Turn adjusting screw (2) clockwise to increase, or anti-clockwise to decrease the oil pressure.

/Cont'd.....

2.7. Check draught.

The draught in the combustion chamber should be about 5 N/m squared (.02" w.g.). If this cannot be checked directly, then check the draught at the flue gas exit and adjust to about 10 N/m squared (.04" w.g.) or to the appliance maker's recommendation.

2.8. Set combustion air.

Using a portable CO<sub>2</sub> indicator, check the CO<sub>2</sub> content of the combustion products at the appliance flue outlet, taking care to sample at a point where there is no dilution by extraneous air.

The reading should be about 11% CO<sub>2</sub> and if necessary adjust the burner air shutter to obtain this. Slacken knob (4) and move towards oil pump to close air shutter, thus increasing the CO<sub>2</sub> reading.

Lock shutter adjusting knob.

2.9. Check smoke.

Check the smoke reading at the same sampling point. This should not exceed Bacharach No. 2.

If the smoke is too high, loosen nuts (5) and adjust position of oil pipe assembly by trial. Moving the assembly backwards has the effect of decreasing dimension 'X' in Fig. (2) which will generally reduce smoke.

### 3. SERVICING.

To maintain optimum performance and to avoid possible breakdowns the burner should be serviced regularly by a qualified engineer. The frequency of attention required may vary widely depending on the conditions of use and the following recommendations are given as a guide. (The number references relate to Fig. 1.)

#### 3.1. Every 3 months.

##### 3.1.1. Clean combustion head.

- a) Switch off electricity.
- b) Undo screws (7) and remove blue inspection disc.
- c) Remove nut (5).
- d) Withdraw photoresistor (3).
- e) Undo union nut (6).
- f) Withdraw oil pipe assembly sufficiently to unclip ignition leads, then withdraw fully.
- g) Clean ignition electrodes and flame ring.
- h) Wipe other parts clean but not nozzle tip. (The nozzle should not normally require attention at this interval).
- i) Re-assemble in reverse order.
- j) Switch on burner and check flame visually.

##### 3.1.2. Check combustion.

Check CO<sub>2</sub> and smoke and if necessary make adjustments as under 2.8 and 2.9.

##### 3.1.3. Check operation of safety control.

- a) Run burner for a few minutes.
- b) Remove photoresistor (3) and cover it to prevent exposure to light.
- c) After about 25 seconds the burner should stop and the red 'lock-out' light (8) should glow.
- d) Replace photoresistor.
- e) Wait two minutes then press the Red button (8) when the burner should start up normally.

/Cont'd.....

3.2. Every 6 months.

Carry out service as under 3.1 but in addition:-

3.2.1. Clean atomising nozzle.

- a) Remove oil pipe assembly as under 3.1.1.
- b) Unscrew nozzle from its holder with a correctly fitting box spanner to avoid damage to hexagon.
- c) Unscrew strainer from rear of nozzle.
- d) With a good fitting screwdriver, unscrew the swirler retaining screw.
- e) Carefully remove swirler and wash all components in clean petrol or paraffin. Any minute particles of dirt in the tangential slots of the swirler are best removed by using the edge of a piece of good quality paper of non-fluffy texture.

The orifice in the nozzle should be cleaned with a sliver of matchwood. (On no account must wire or any metallic instruments be used to clean the orifice or swirl slots, as even small scratches on these delicate parts can adversely affect the spray characteristics.)

- f) Re-assemble the nozzle taking care that the conical end of the swirler seats correctly on to the corresponding face in the nozzle body, and that the swirler retaining screw is screwed firmly home.
- g) Clean and replace strainer and re-fit nozzle into nozzle holder, making sure that it is firmly tightened.
- h) Re-assemble oil pipe into the burner.

3.2.2. Oil burner motor.

Apply two or three drops of good quality thin lubricating oil to the two oiling points on the motor.

3.3. Every 12 months.

Carry out service as under 3.1 and 3.2. but in addition:-

3.3.1. Clean burner thoroughly.

Remove burner from appliance and thoroughly clean all parts to remove any dust, fluff or deposits. To clean the air impeller it may be necessary to undo the four motor retaining bolts and withdraw the motor and impeller as a unit. When re-assembling ensure that the nylon dog on the impeller hub engages with the splined flexible coupling rod.

/Cont'd.....

3.4. Every 2 years.

In addition to all service attention detailed above, clean oil filters.

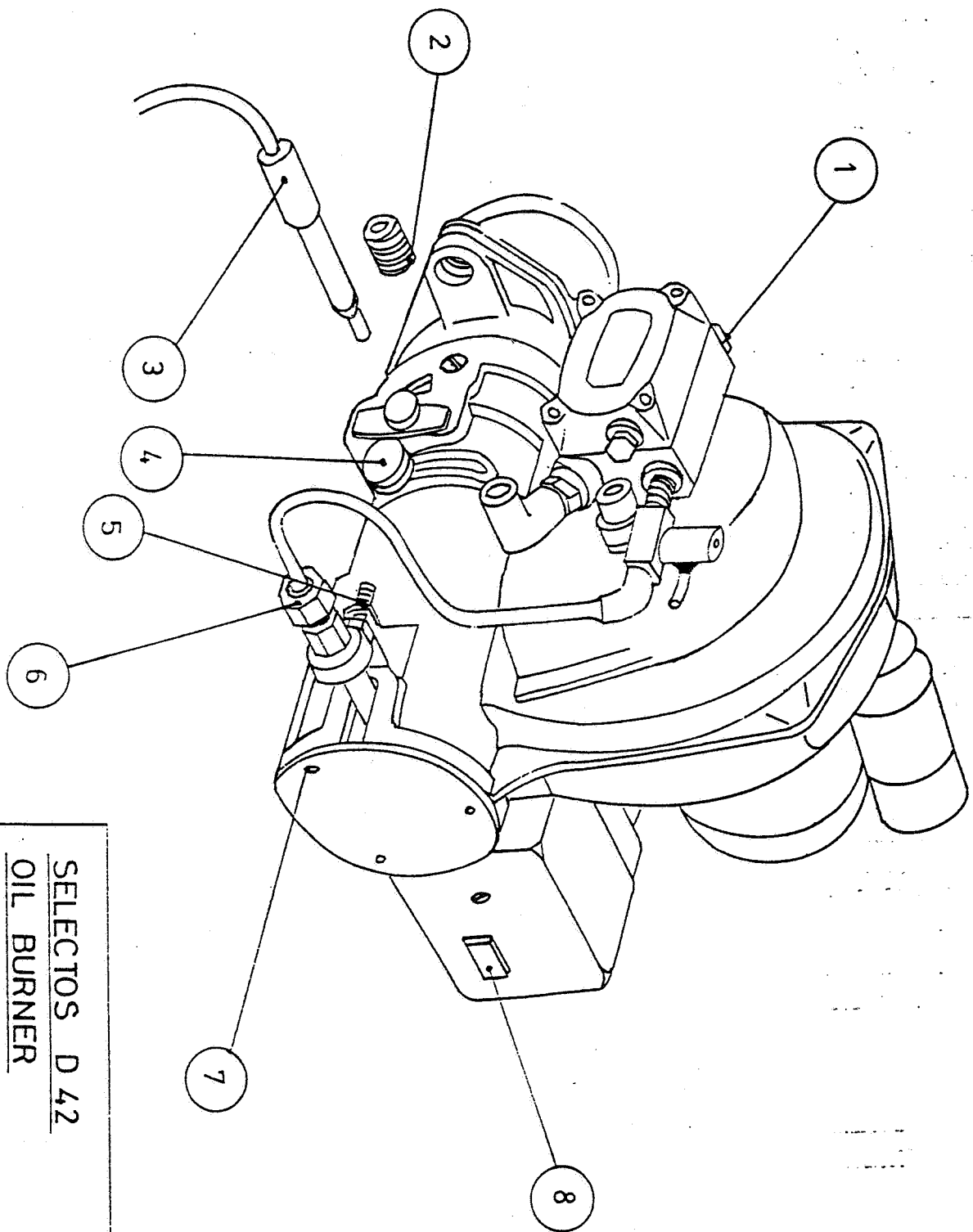
3.4.1. Oil supply filter (Crossland Minibowl).

- a) Turn off oil.
- b) Unscrew bowl retaining bolt, and lower bowl.
- c) Remove paper element and replace with a new one of the correct type (Crossland No. 489).
- d) Re-assemble bowl.
- e) Turn on oil, check that bowl is oil tight and bleed off any air through the bleed screws on top of the body.

3.4.2. Oil pump filter.

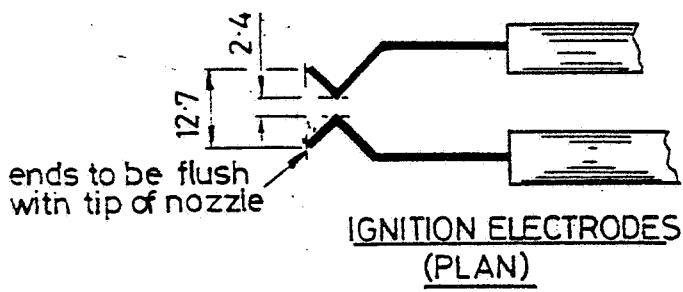
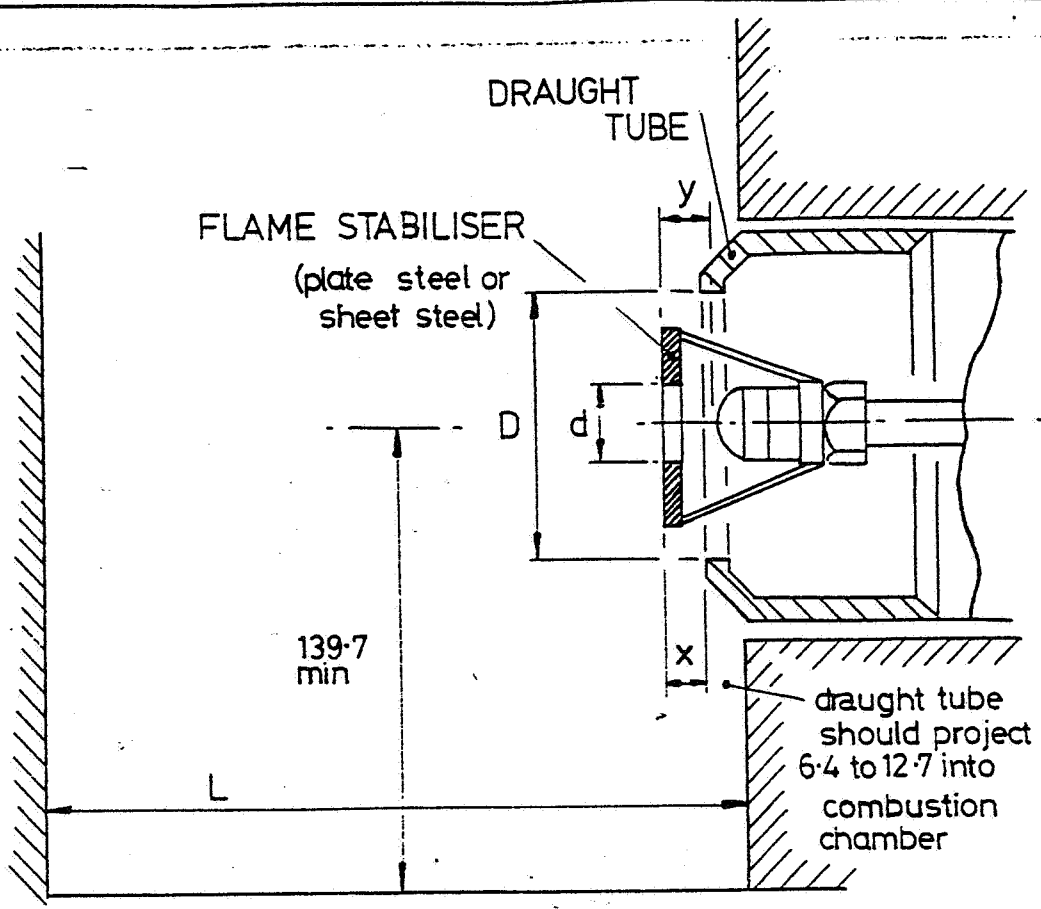
- a) Undo four socket screws which retain pump end cover.
  - b) Remove end cover carefully, avoiding damage to gasket.
  - c) Remove filter element and clean with petrol or paraffin.
  - d) Re-assemble element and end cover.
-





SELECTOS D 42  
OIL BURNER

FIG.1  
1977

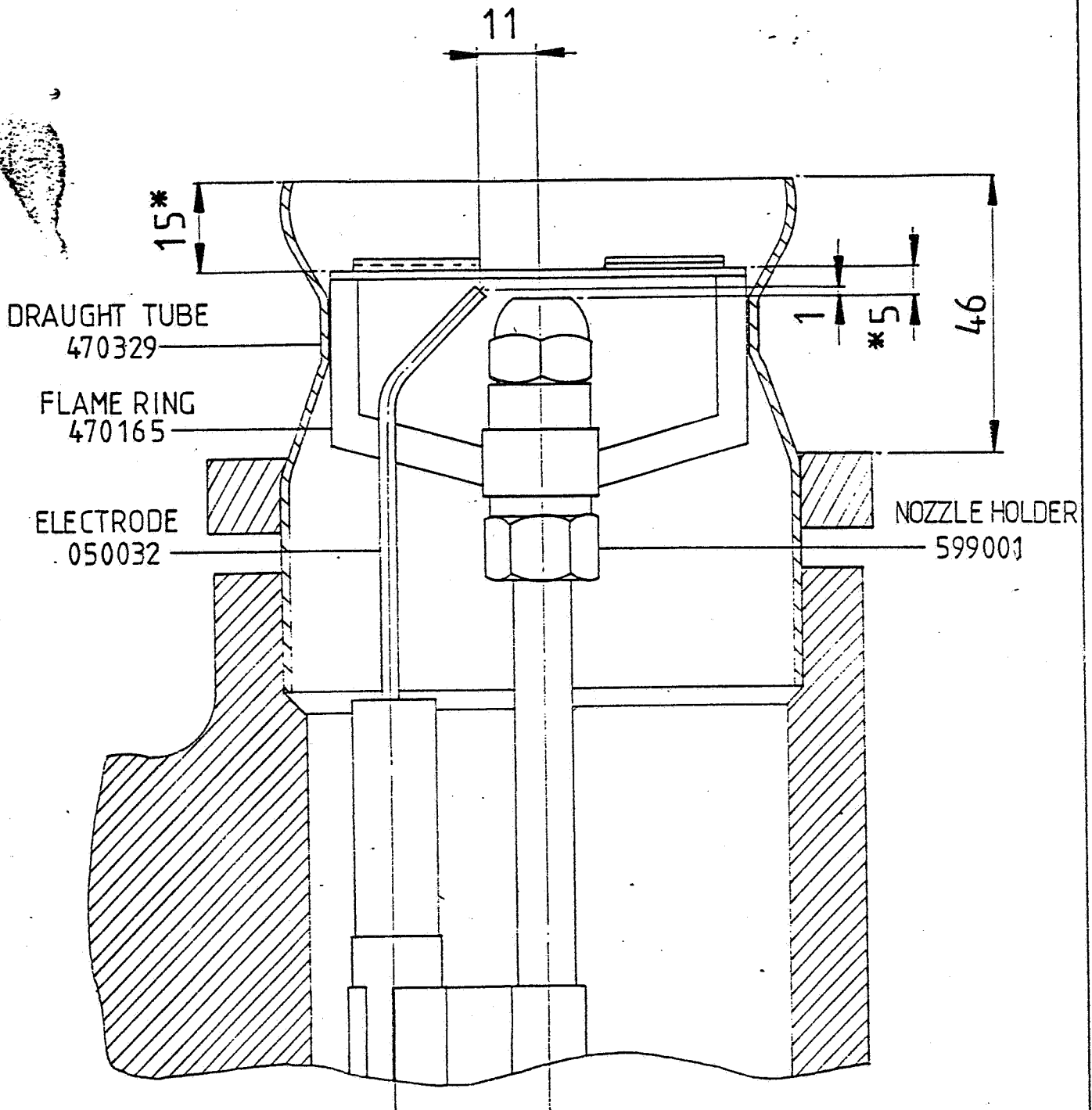


MONARCH NOZZLE (U.S. gals)	DRAUGHT TUBE			FLAME RING					DIMENSIONS	
	REF	PART Nº	D (mm)	PART Nº	PLATE X STEEL*	PART Nº	SHEET X STEEL	d (mm)	Y (mm)	L (min)
0.5/80°AR	AA	621004	57.2	470027	(flush)	470050	(flush)	23.4	6.4	203
0.65/80°AR	A	621001	60.3	470027	(flush)	470050	(flush)	23.4	6.4	203
0.75/80°AR	A	621001	60.3	470022	1.6	470051	(flush)	29.3	6.4	229
0.85/80°AR	A	621001	60.3	470022	3.2	470051	1.6	29.3	6.4	229
1.0/80°AR	A	621001	60.3	470022	3.2	470051	1.6	29.3	6.4	254
1.25/80°AR	A	621001	60.3	470022	4.7	470051	3.2	29.3	6.4	305
1.35/60°AR	B	621002	63.5	470022	4.7	470051	3.2	29.3	9.5	330
1.5/60°AR	B	621002	63.5	470022	6.2	470051	4.7	29.3	9.5	356
1.65/60°AR	B	621002	63.5	470022	6.2	470051	4.7	29.3	9.5	406
1.75/60°AR	C	621003	66.6	470022	6.2	470051	4.7	29.3	9.5	406
2.0/60°AR	C	621003	66.6	470022	7.9	470051	6.4	29.3	9.5	457

\* (readily adjustable on site, see para. 2:9)

SELECTOS D.42 BURNER  
Combustion Head Details

FIG. 2  
1977



NOTE :-  
 ELECTRODE GAP 4mm.  
 DIMENSION MARKED \*  
 VARIES ACCORDING  
 TO BOILER  
 APPLICATION.

FIRING RATE kW	US gals	NOZZLE SIZE	PUMP PRESS
40,5	1,01	STEINEN 0,85 / 60°S	11 bar
50,2	1,25	MENARCH 1,0 / 45°R	12 bar
60,0	1,51	MONARCH 1,35 / 45°R	8,5 bar

SELECTOS D42F

Combustion head Details.

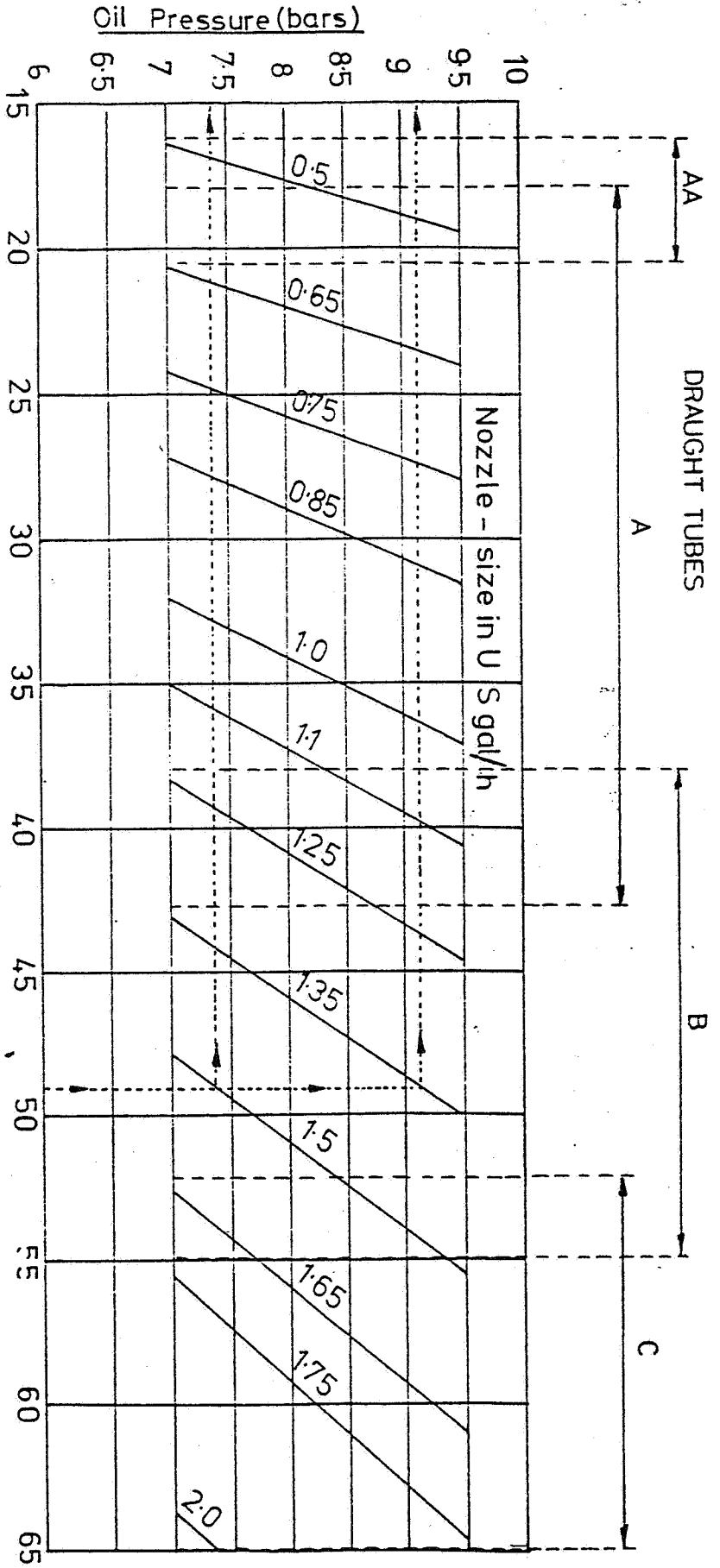
FIG

2A

SELECTOS D 42 BURNER

FIG. 3

1977



Example :-

Output required = 48 kW.

Follow dotted line and read off :-

- 1.5 U S gal/h nozzle at 7.4 Bars
- or 1.35 U S gal/h nozzle at 9.2 Bars

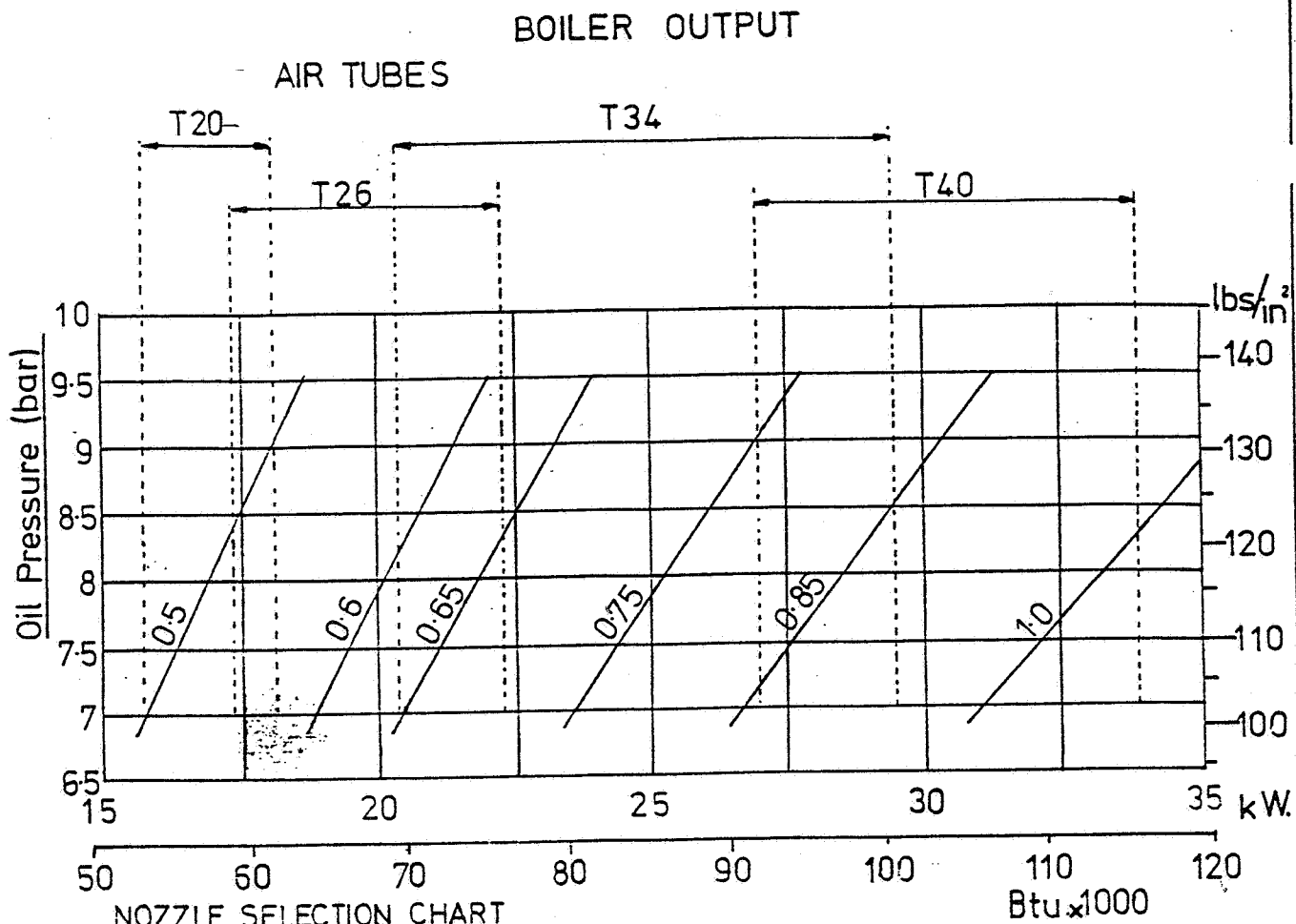
} use draught tube B

BOILER OUTPUT kW.

NOTE:-

Monarch 80%AR nozzles are recommended below 1.35 gal/h and 60%AR for the larger sizes but where possible the appliance makers recommendations should be followed. The above chart, which is approximate and based on a thermal efficiency of 78%, relates to class D fuel (35sec); for class C fuel (kerosene) increase pressure by 20%.

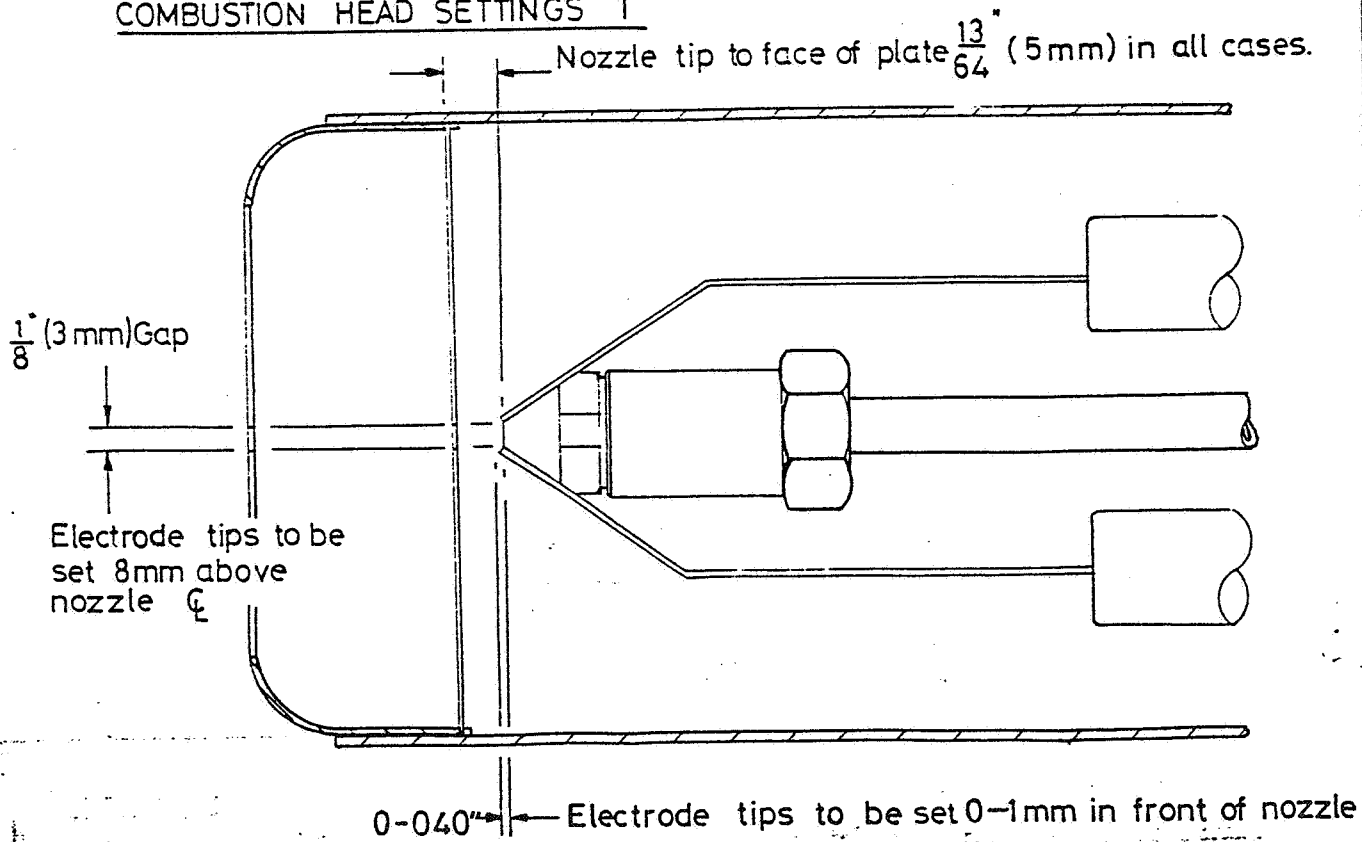




The above chart is approximate and based on a thermal efficiency of 77%. It relates to class D fuel (35 sec.). To obtain the same output from class C fuel (kerosene), increase pressure by 20 %.

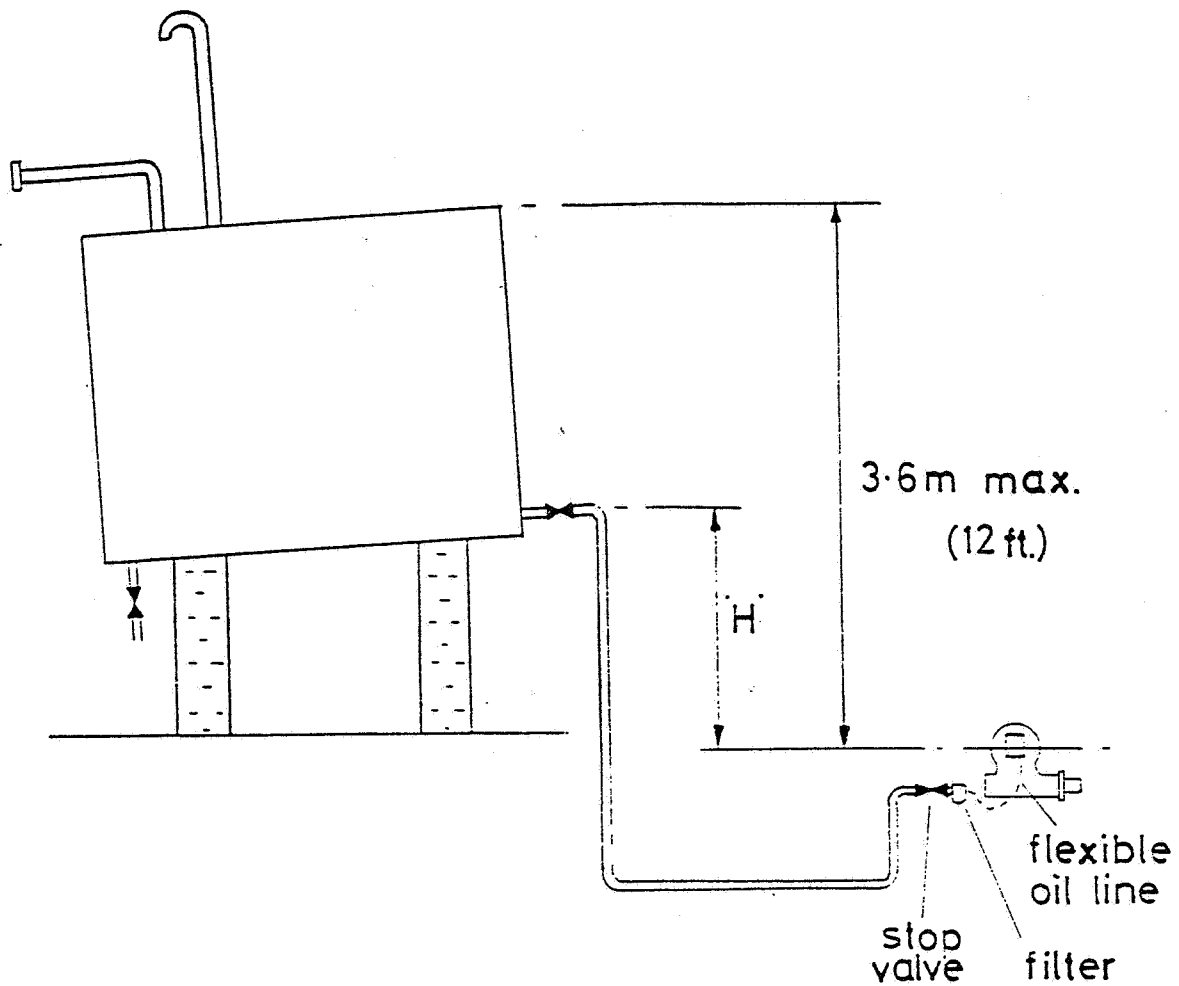
**FIG. 4**

### COMBUSTION HEAD SETTINGS 'T'



Recommended settings for all 'T' series combustion heads.

**D.42 FIG.5**

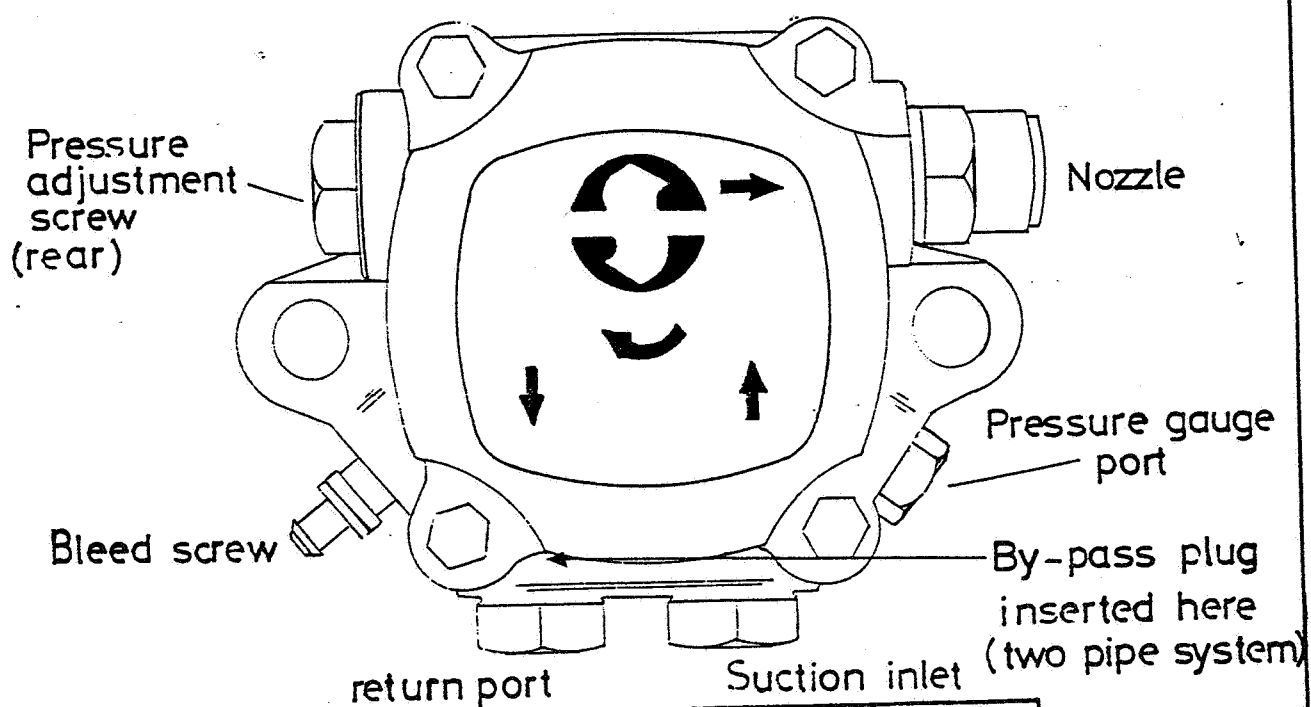
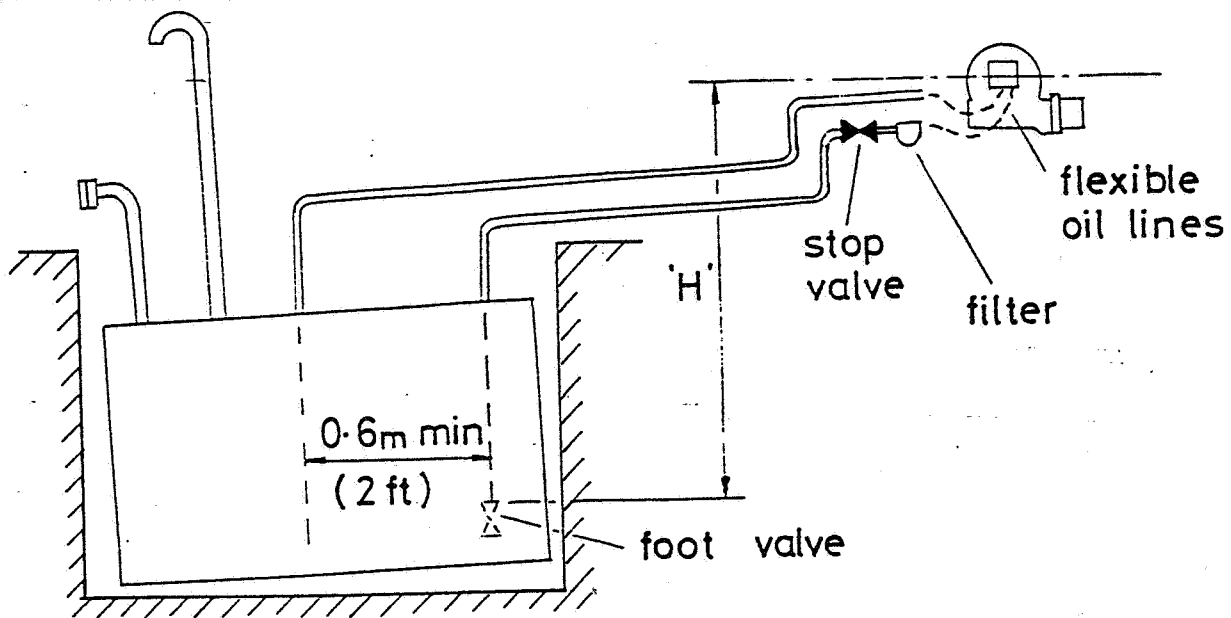


Lift 'H'		MAX. ALLOWABLE PIPE RUN			
m	ft	m 8mm I.D. ft		m 10mm I.D. ft	
NIL	—	5	16	46	150
0.3	1	20	66	46	150
0.6	2	46	150	46	150
0.9	3	46	150	46	150
1.2	4	46	150	46	150
1.5	5	46	150	46	150

THESE FIGURES ARE FOR EQUIVALENT LENGTH AND THEREFORE DUE ALLOWANCE SHOULD BE MADE FOR BENDS, VALVES & FITTINGS. FOR SPECIFIC INSTRUCTIONS SEE PUMP MANUFACTURERS CURRENT LEAFLET. PIPE LENGTHS ABOVE 50m NOT RECOMMENDED

SELECTOS D42. BURNER  
Single Pipe Oil Supply

FIG. 6  
1977



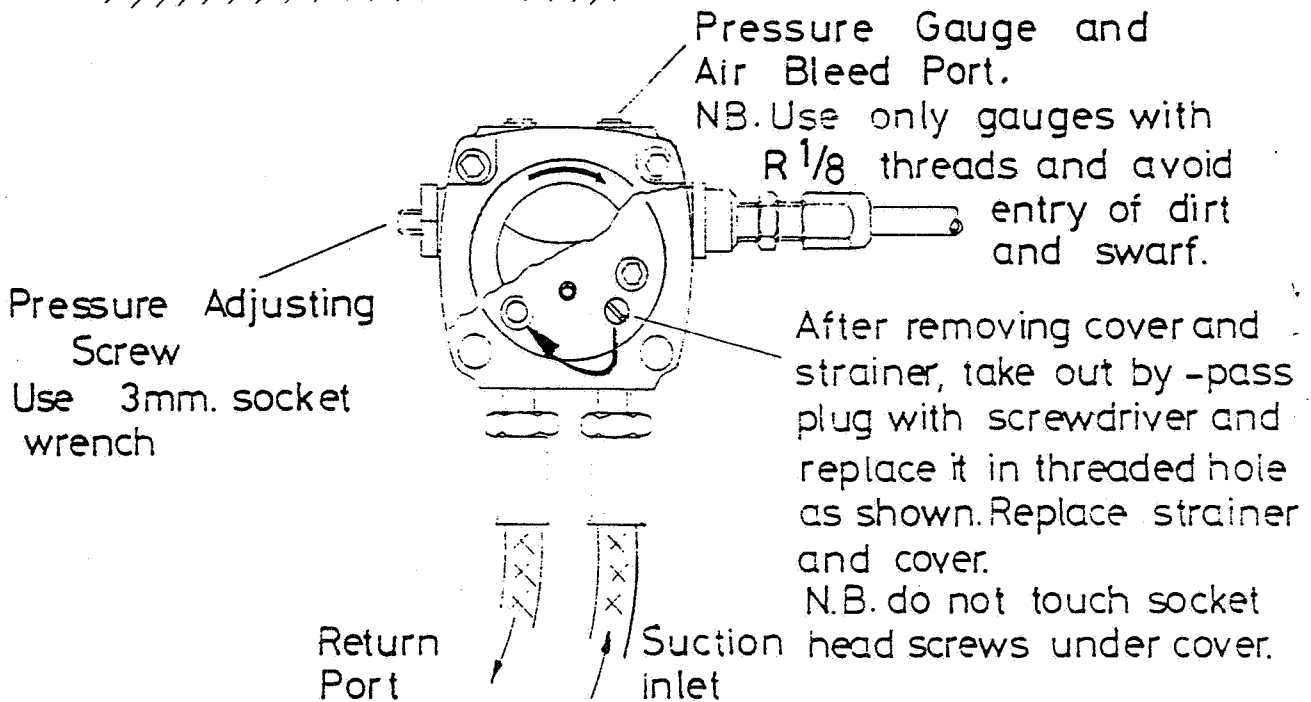
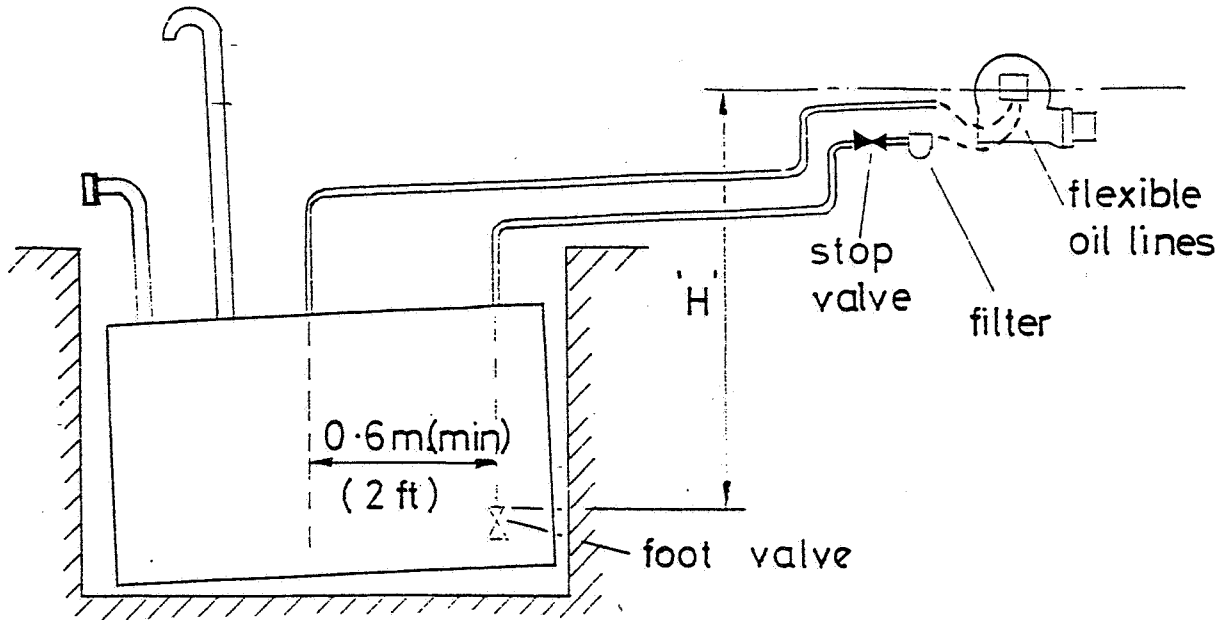
LIFT		Max. allowable pipe run			
m	H ft	m	8 1/2 DIA. ft	m	10 1/2 DIA. ft
NIL	—	50	164	50	164
0.5	1.64	50	164	50	164
1.0	3.28	50	164	50	164
1.5	4.92	50	164	50	164
2.0	6.56	44	144	50	164
2.5	8.20	37	121	50	164
3.0	9.84	30	99	50	164
3.5	11.48	23	75	50	164

SELECTOS D42 BURNER — Two pipe oil supply system

SUNDSTRAND  
AN 45C  
AS 47C

FIG. 7  
1977



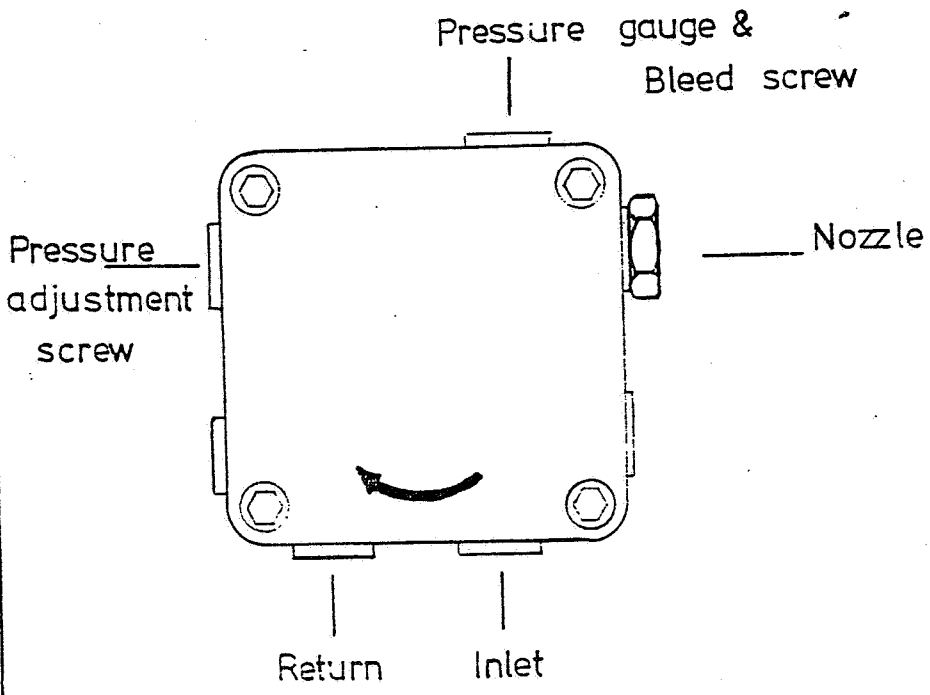
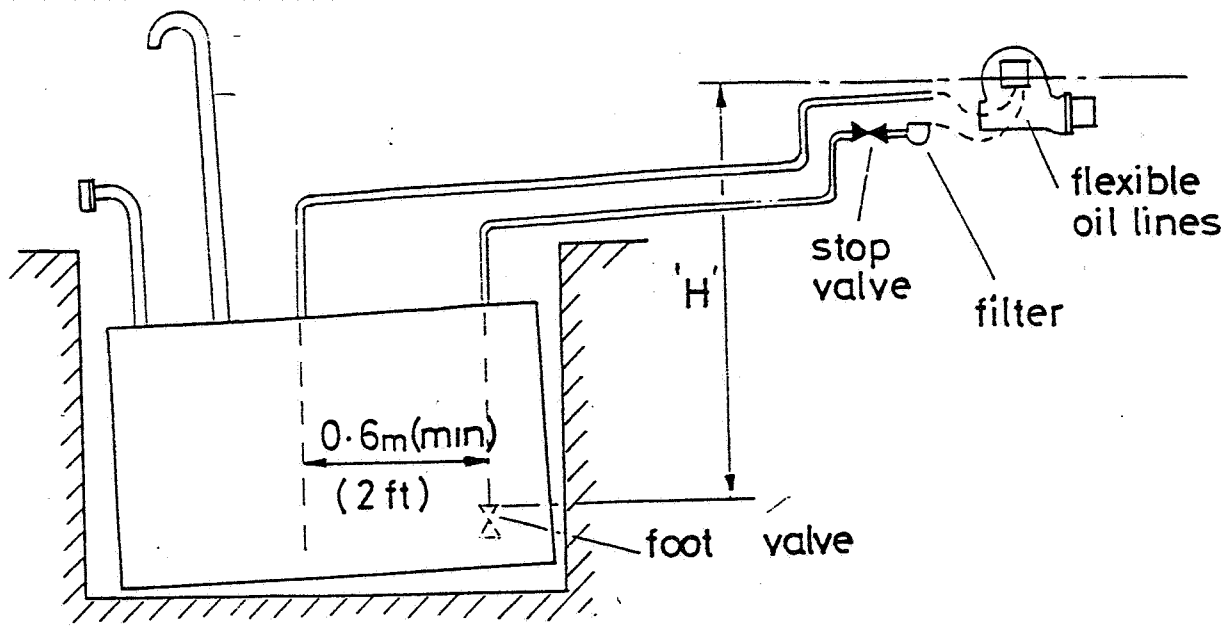


Lift 'H'		Max. allowable pipe run			
m	ft	8mm I.D.		10mm I.D.	
		m	ft	m	ft
	NIL	36	118	50	164
0.3	1	34	111	50	164
0.6	2	32	104	50	164
0.9	3	28	92	50	164
1.2	4	27	89	50	164
1.5	5	26	85	50	164
1.8	6	24	79	50	164
2.1	7	22	72	50	164
2.4	8	20	66	50	164
2.7	9	18	59	46	151
3.0	10	17	56	40	131

SELECTOS D42 BURNER - MINIMASTER PUMP

Two pipe oil supply system.

FIG. 8.  
1977

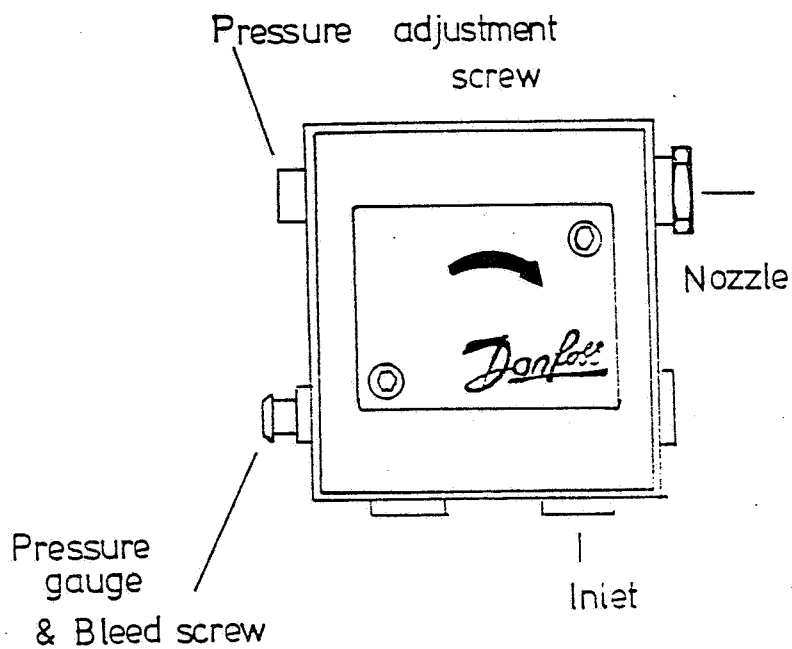
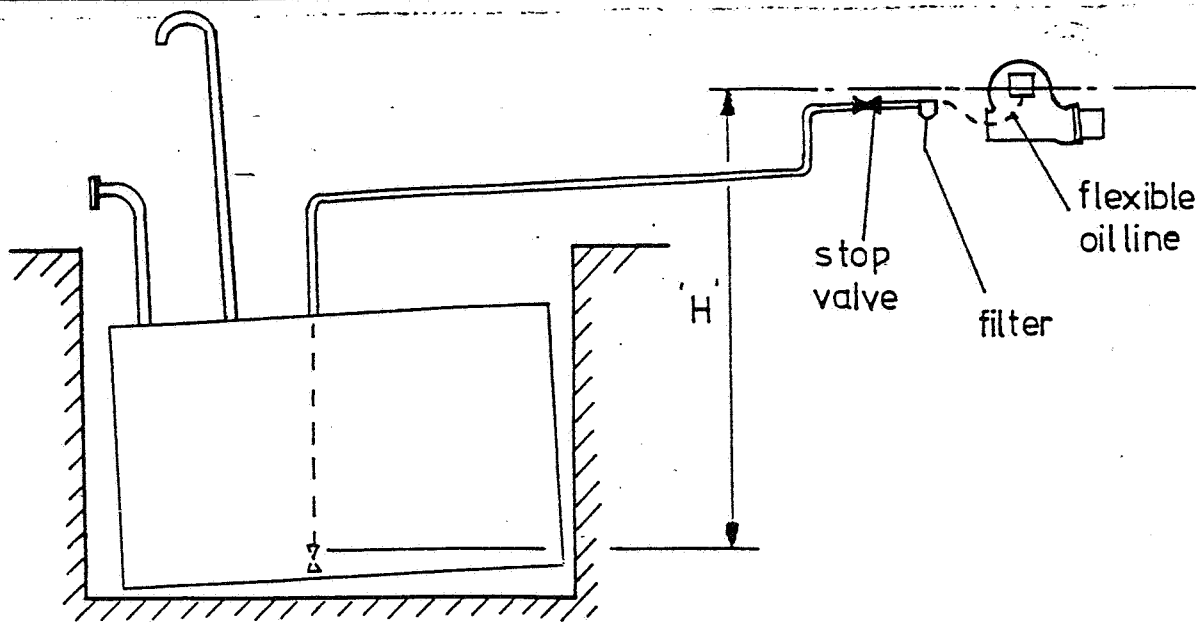


LIFT 'H'		MAX. Allowable pipe run (m)							
		O.D. 6 mm		O.D. 8 mm		O.D. 10 mm		O.D. 12 mm	
m	ft	m	ft	m	ft	m	ft	m	ft
nil		27	88.6	50	164	50	154	50	164
0.5	1.6	23	75.5	50	164	50	164	50	164
1.0	3.3	20	65.6	50	164	50	164	50	164
1.5	4.9	17	55.7	50	164	50	164	50	164
2.0	6.6	13	42.6	43	141	50	164	50	164
2.5	8.2	10	32.8	33	108	50	164	50	164
3.0	9.8	7	23.0	22	72	50	164	50	164
3.5	11.4	3	9.8	12	39	29	95	50	164
4.0	13	0	0	0	0	0	0	7	23

SELECTOS D42 BURNER  
Two pipe oil supply system

DANFOSS  
RSL 028

FIG. 9  
 1977



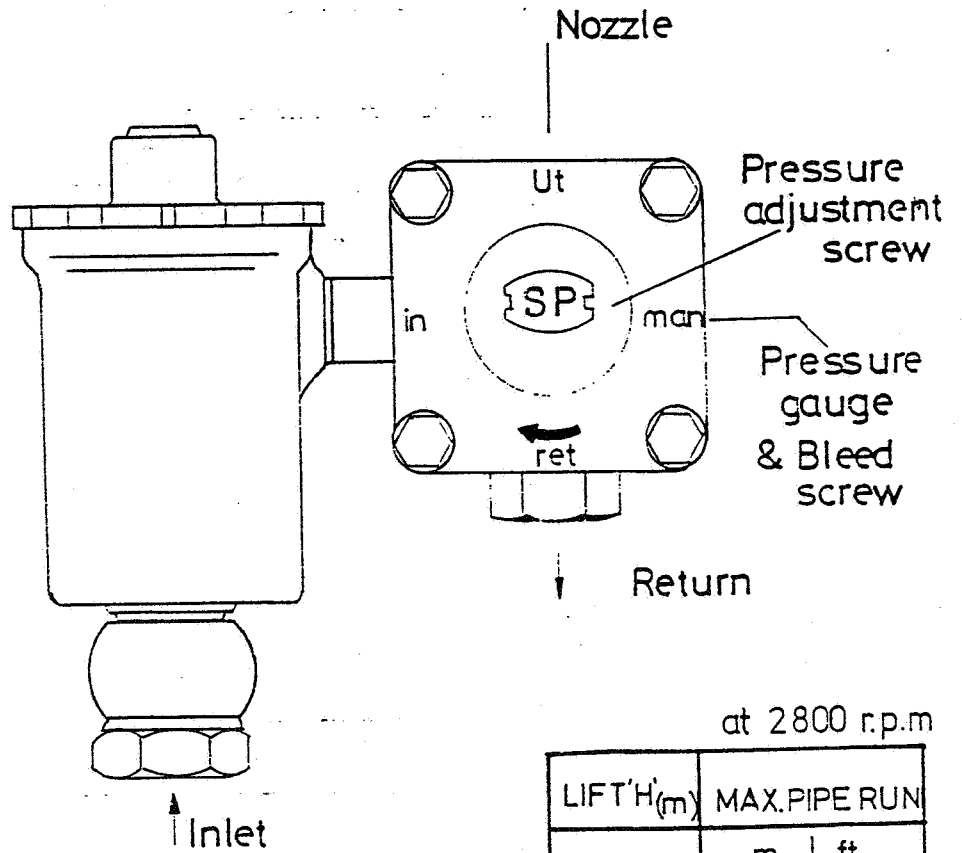
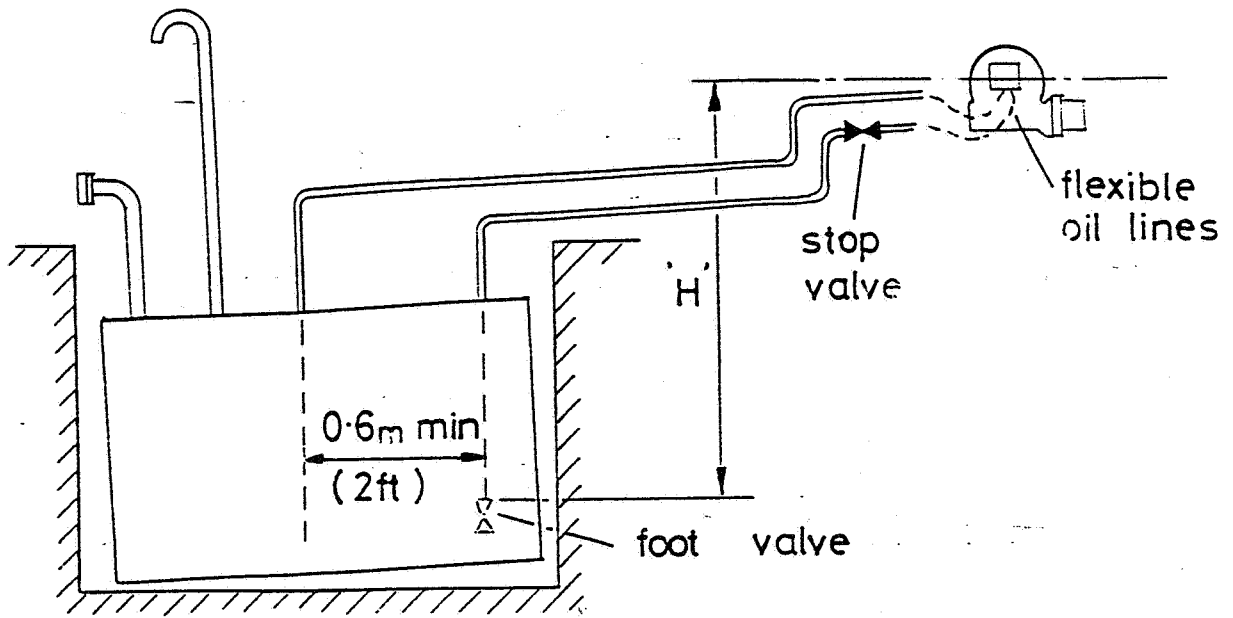
LIFT 'H'	PIPE RUN	
	m	ft
NIL	50	164
0.5	50	164
1.0	50	164
1.5	50	164
2.0	50	164
2.5	42	135
3.0	25	82

6mm  
I.D. pipe

SELECTOS D42 BURNER  
Single pipe oil supply system

DANFOSS  
MSLB 032

FIG 9A  
1977



3 mm I.D.  
pipe

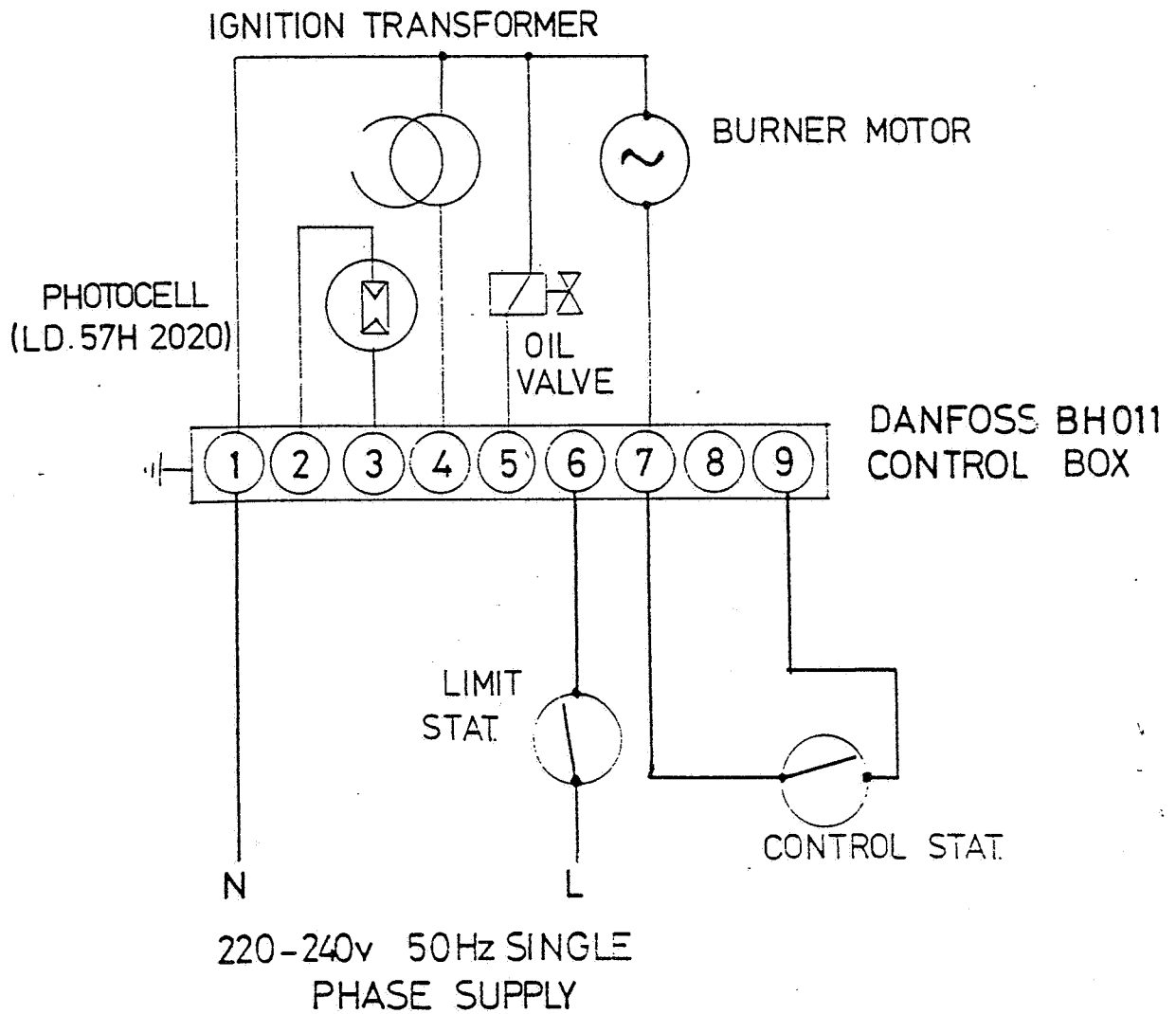
at 2800 r.p.m

LIFT 'H' (m)	MAX. PIPE RUN	
	m	ft.
0.5	50	164
1.0	50	164
1.5	50	164
2.0	42	137
2.5	34	111
3.0	28	98
3.5	20	66
4.0	12	39

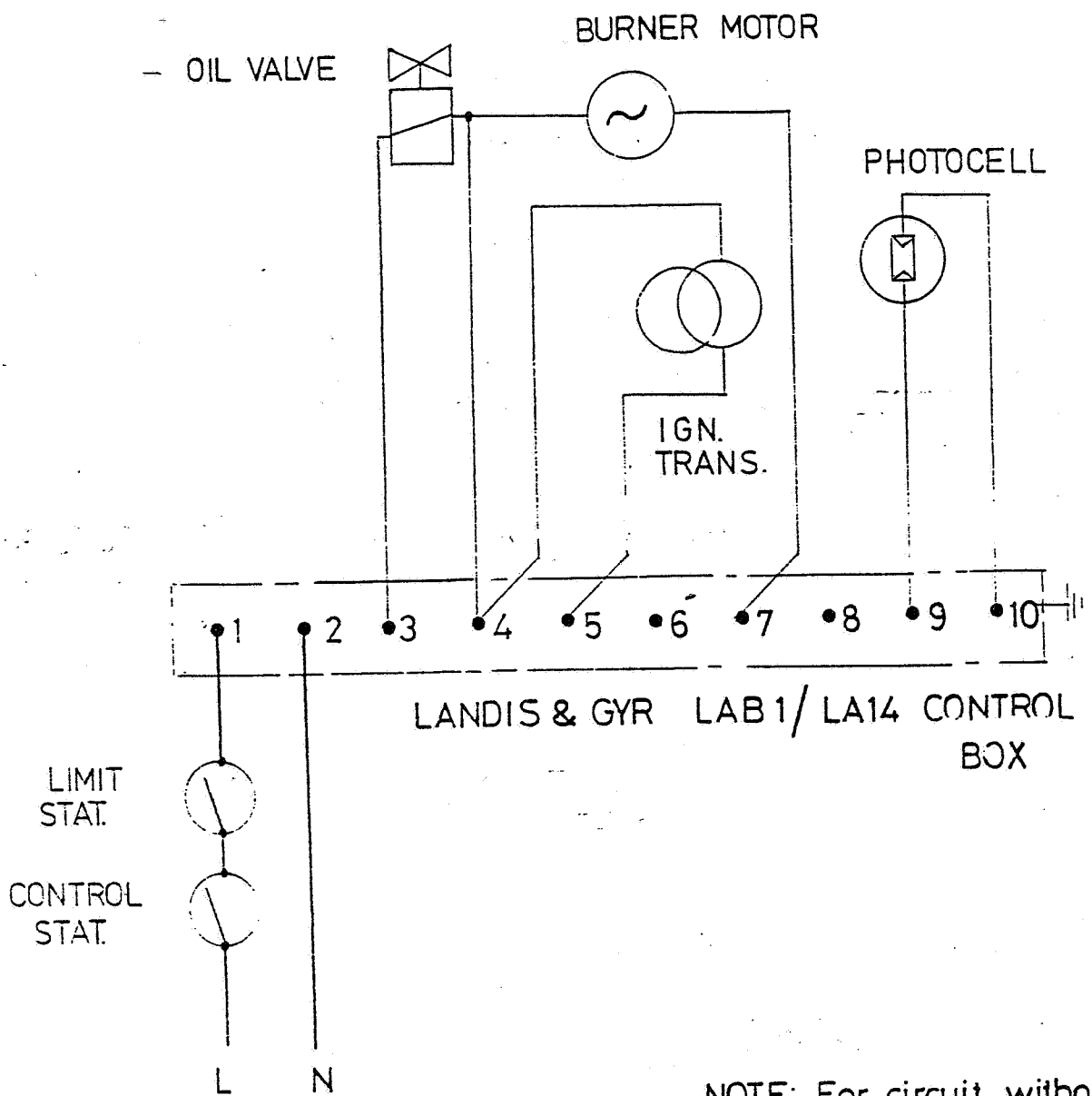
SELECTOS D42 BURNER  
Two pipe oil supply system

SP.65 PUMP

FIG10  
1977

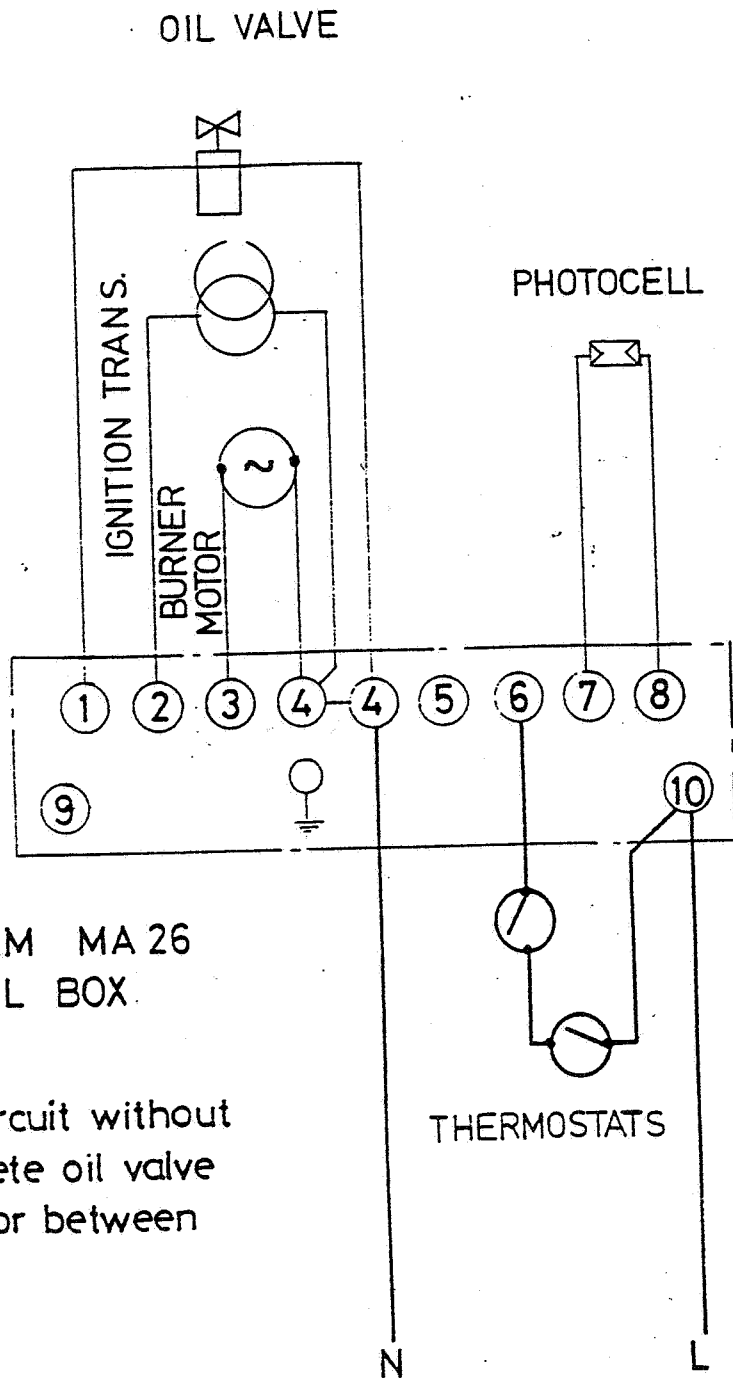


NOTE: For circuit without pre-purge, delete oil valve and place motor between 1 & 5



NOTE: For circuit without pre-purge, delete oil valve and place motor between 3 & 4





PETERCEM MA 26  
CONTROL BOX.

NOTE: For circuit without  
pre-purge, delete oil valve  
and place motor between  
1 & 4

220 - 240v 50 Hz  
SINGLE PHASE SUPPLY

SELECTOS D 42 BURNER  
PETERCEM MA 26 CONTROL BOX

FIG.14  
1977