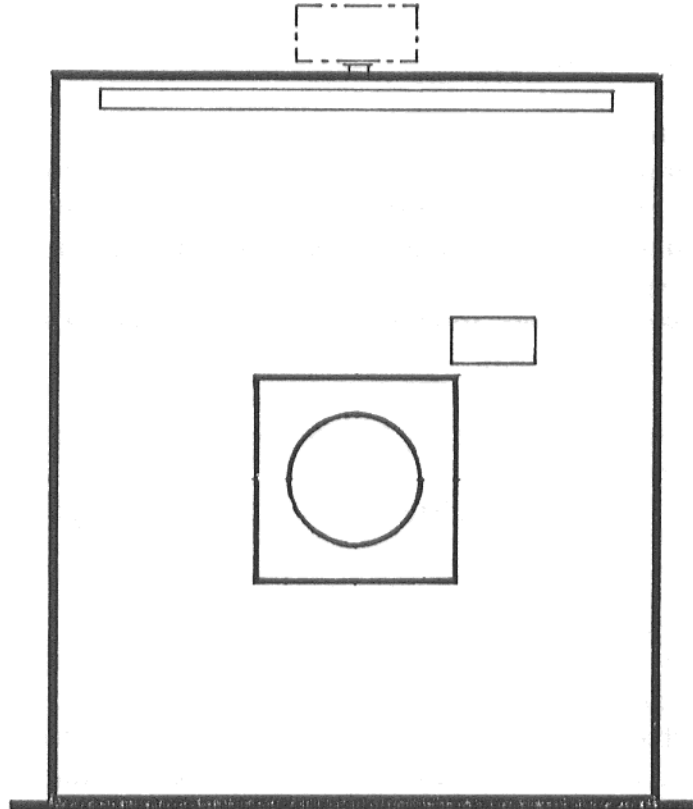


Installation Instructions

“Logana” GK 305
Oil/gas heating boilers



“Logana” GK 305
239.000 . . . 478.000 BTU/HR

Important notes on the use of heating boilers

It is essential to follow the installation instructions in the sequence described in order to ensure many years of reliable boiler operation.

The instructions are intended for use by installers.

These boilers are suitable for
a max. flow temperature of 248 °F
a max. operating overpressure 52 Psi

The details on the nameplate are relevant and should be observed.

Connecting pipes should be run and connected to the boiler free of stress.

For boiler and feed water requirements see your wholesaler.

Conversion to gas firing (forced draft burner) is not subject to any special requirements. Thoroughly clean the boiler, then carry out the change-over.
Note boiler room guidelines!

Points to be noted:

Single jointing of sections using Buderus sealing cord.

The sealing of flueways of individual sections in relation to each other is accomplished from one side only, i. e. always from the rear of the section as installation progresses. See page 10 to 13 for further details.

All doors, cleaning covers, mountings etc. which must be removed or opened for servicing are installed with a stranded sealing cord.

Initial boiler start-up may only be carried out by the contractor or an expert technician nominated by him.

The operator must be instructed in the correct operation of the boiler (and the system).

Oil and gas burners

Due to the low heating gas pressure losses of the boiler it is possible to install any oil or gas burner type. Burners with reduced start-up device or two-stage burners, of course, have more favourable start-up characteristics and should therefore be preferred. In order to avoid a temperature drop below dew point on the boiler heating surfaces and in the exhaust system, fuel throughput must be adjusted with the boiler running at full load in accordance with nominal boiler capacity. Where forced-draft gas burners are used with fluctuations in calorific values being a possibility, fuel throughput must be adjusted according to the lowest possible NCV. Hygienic requirements must be observed. The CO volume percentage must not exceed 0.1% relative to undiluted dry exhaust gas.

Two-stage burners must be set to at least 60% of boiler nominal capacity in the first stage. For the same reason, when using a modulating burner on "Logana" GK 305, a minimum return temperature of 122 °F must be ensured.

Local provisions should be observed.

Index

1. Technical data and boiler dimensions

2. Boiler foundation and sound-absorbing boiler base with mounting rail

3. Assembly of boiler sections

4. Hydraulic test

5. Mounting and sealing of fittings

6. Burner assembly

7. Boiler casing assembly

Erecting Instructions “Logana” GK 305

Upon receiving, unpack shipment carefully and check for completeness and damages. All equipment is carefully manufactured, inspected, and packed. Our responsibility ceases upon delivery of crated boiler to the carrier in good condition.

Any claims for damage or shortage must be filed immediately against the carrier by the consignee.

Scope of delivery

assembled boiler sections:

- Skid:
boiler body with door
and smokehood
- Cardboard box:
insulating jacket
- Cardboard box:
flow manifold,
return flange, controls (if ordered)
- or

in loose sections:

- Skid:
sections
- Crate:
door, smokehood,
assembly material,
tie bars
- Cardboard box:
insulating jacket,
brushes
- Cardboard box:
flow manifold,
return flange,
controls (if ordered)

Further optional accessories (if ordered) are packed separately.

General (Safety Information)

The boiler is to be installed by a qualified contractor familiar with state and local regulations.

All instructions and schematics are provided for reference purposes. Your state or local regulations may dictate that alternate procedures be used. All local codes take precedence over these installation instructions.

The hot water distribution system is not covered by this manual. It is important that the condition of the system be checked to insure safe operation at the time of installation.

Any leaks in the system should be sealed, no matter how small. Continuous feeding of fresh water into any heating system can damage or block the water passages.

For assembling the burner to the boiler, follow the instructions of the burner manufacturer.

Delivery

Boiler is supplied in loose sections with mounting rail (or, upon request, as a block [models 70 and 95] without mounting rail). Fittings in packing case. Tie rods contained in case of fittings.
Installation instructions, boiler documentation, boiler upper rear panel with insulation, plugs, seals and hexagon head screws in carton.
Boiler casing in carton.
Sound absorbing boiler base (mounting rail and insulating mat) is optional.

Tools and auxiliary materials

The following tools and auxiliary materials are required for assembly of the boiler:

Complete set of pressure-drawing tools (2off); pressure-drawing tools size 1

Manual hammer and mallet or rubber hammer

Half round file

Screw driver (philips head and normal)

Flat chisel, wedges, metal strips

Spanners SW 13; 19; 24 and 36, also socket spanner SW 19

Red lead putty in linseed oil (for bosses and nipples)

Steel wool, rags

Fine emery paper

Machine oil

Solvent (petrol or thinner)

Sealing cord (stranded and elastic sealing cord)

Spirit level, yard stick, chalk, straight edge

Primer (only as adhesive for elastic sealing cord)

Pressure-drawing tools (size 1)

Overall length of tie rods 54 $\frac{1}{8}$ inch

With G_305 boiler series two additional 4 $\frac{5}{8}$ inches diameter flanges are supplied for the lower boss.

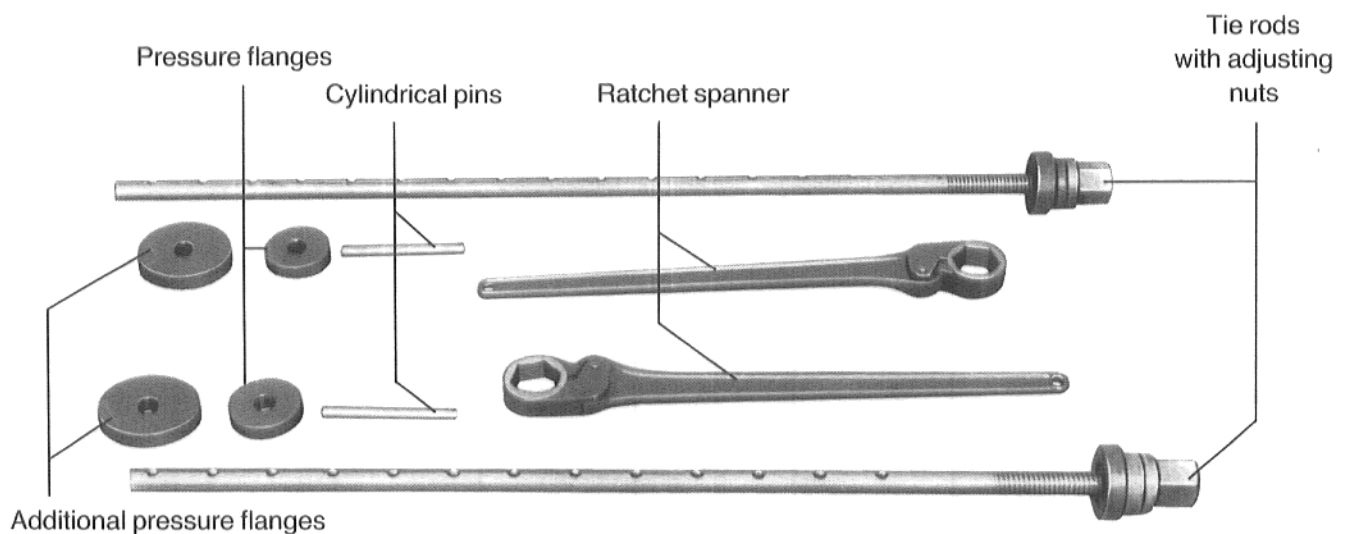


Fig. 1

1. Technical data and boiler dimensions

Buderus "Logana" GK 305 cast iron heating boilers for liquid and gaseous fuels.

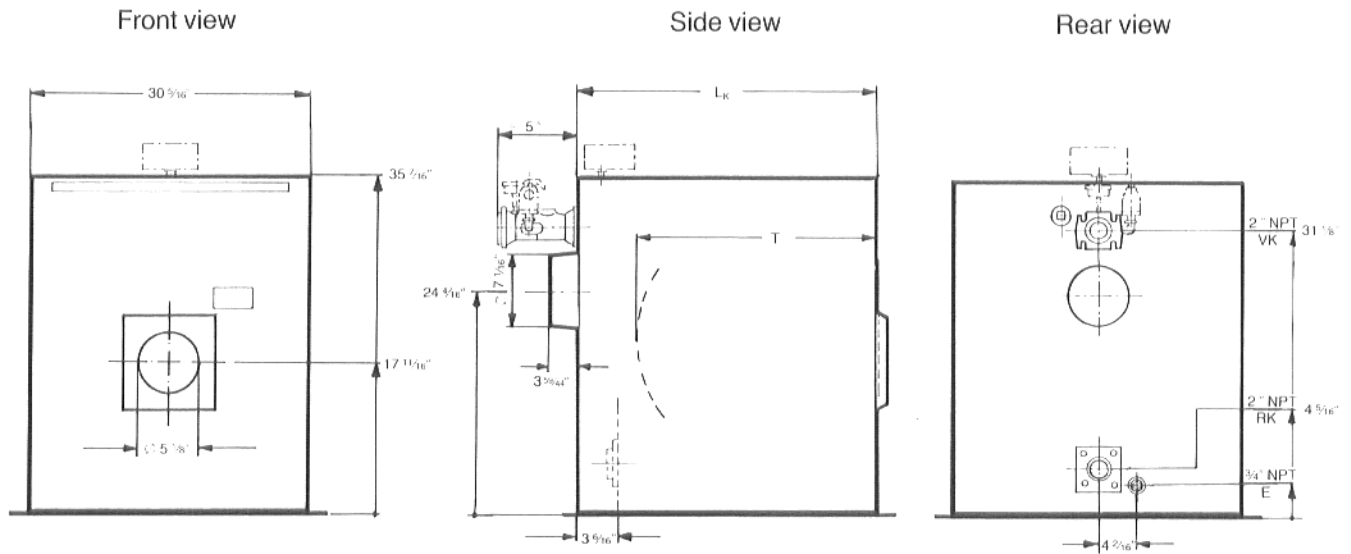


Fig. 2

Fig. 3

Fig. 4

Number of sections	Boiler size	Gross output	Firing rate	Boiler length	Combustion chamber length	Flue connection dia	Net weight
		BTU/Hr.	GPH	L_K in.	T in.	D_A in.	
5	70	239.000	2.00	$31 \frac{1}{8}$	$22 \frac{15}{16}$	7	1025
6	95	324.000	2.41	$35 \frac{13}{16}$	$27 \frac{11}{16}$	7	1195
7	115	393.000	2.81	$40 \frac{9}{16}$	$32 \frac{7}{16}$	7	1365
8	130	444.000	3.21	$45 \frac{1}{4}$	$37 \frac{1}{8}$	7	1534
9	140	478.000	4.02	50	$41 \frac{7}{8}$	7	1704

With flue gas temperatures below 320 °F partial removal of the barrier ribs on the lefthand and righthand side in the upper part of the front section will allow the flue gas temperature to be raised. If this is not sufficient, the exhaust system must be arranged in such a way as to avoid damage from condensate. See also fig. 13b and table.

Number of sections	Boiler flow KV in.	Boiler return KR in.	Gas capacity gal	Boiler water capacity gal
5	2	2	38	21
6	2	2	46	25
7	2	2	54	28
8	2	2	63	31
9	2	2	71	35

Location

When locating the boiler a minimal clearance of 16" to the right must be observed to permit swinging of the burner door. Locate the boiler on a suitably prepared foundation. The boiler door should be flush with the edge of the foundation at the front. Level the boiler from side to side and front to rear using metal chocks or shims as required before any piping is installed. Inspect the cement between the sections. Replace with furnace cement any sections where the cement has cracked or fallen out.

Position the boiler as close as possible to the chimney and be sure to provide the minimum clearances around the boiler as indicated under Minimum Clearances.

2. Boiler foundation and mounting rail

We recommend that the boiler be mounted on a concrete or bricked plinth approx. 2 to 3 in. high, and completely level and plane.

When pouring the plinth it is useful to incorporate either 4 x 1/2 in. flat iron or 4 x 2 1/2 in. angle iron (fig. 7).

For foundation dimensions and length of flat and angle iron see fig. 7:

No. of boiler sections	5	6	7	8	9
Foundation dimension "L ₁ "; flat steel or	30	35	40	44	49
angle steel length "L ₂ "	23	28	32	37	42

Mounting the boiler

Please note minimum dimensions between boiler and wall to allow for opening of burner door and also for installation and removal of boiler casing. This is of particular importance, where a multiple of boilers is installed.

The burner door may be optionally hinged on the righthand or lefthand side, depending on which way it shall open.

The distance of the burner from the wall is calculated as follows:

"W₂" = burner projection: "A" + 4 in.; (minimum 20 in.).

Distance from wall: "W₁" minimum 20 in.

The following dimensions should be maintained:

In front of boiler: boiler length "L" + 40 in. = W₃

Behind boiler: 1/2 of boiler length + 20 in. = W₄

(see figures 5 and 6).

Air supply for boiler room

Sufficient air must be provided to the boiler room at all times. In buildings of conventional frame, brick, or stone construction without enclosed utility rooms, basement storm windows, or tight stair doors, infiltration is normally adequate to provide air for combustion and for operation of the barometric draft control.

For installation in an enclosed utility room or boiler room without an outside wall, a fresh air opening to the outside with a **free** cross sectional area of at least twice the area of the flue outlet of the boiler is recommended. For each 1,000 feet above sea level, increase the fresh air opening by 4 per cent. The boiler room should be isolated from any area served by exhaust fans. **Do not install an exhaust fan in the boiler room.**

Mounting the boiler

for dimensions see page 7

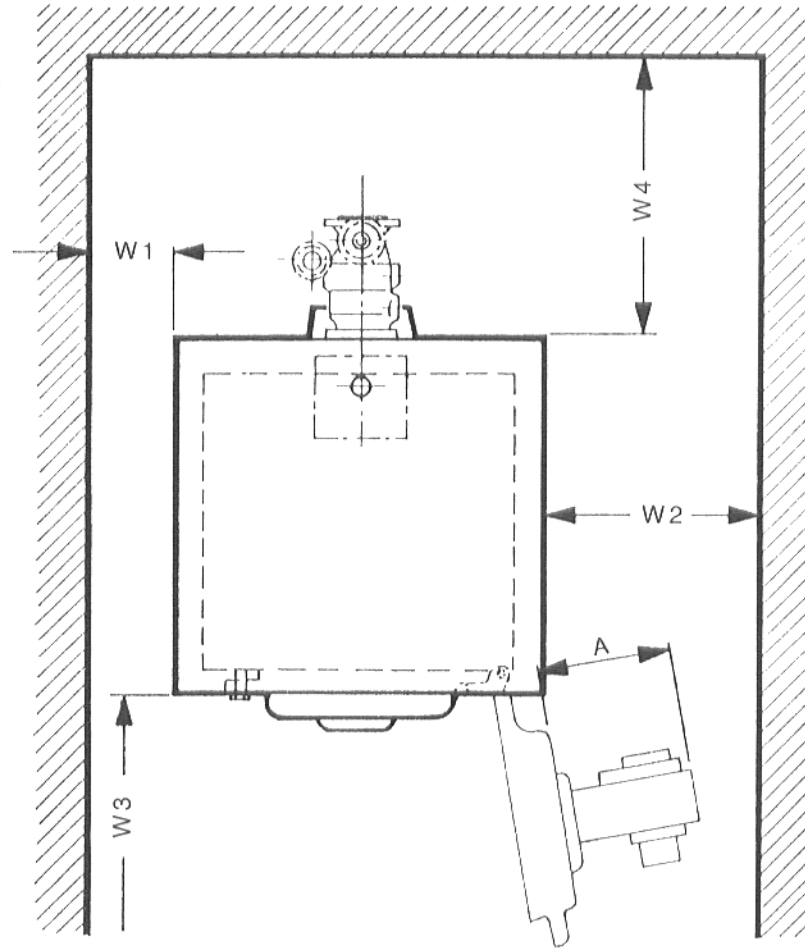


Fig. 5

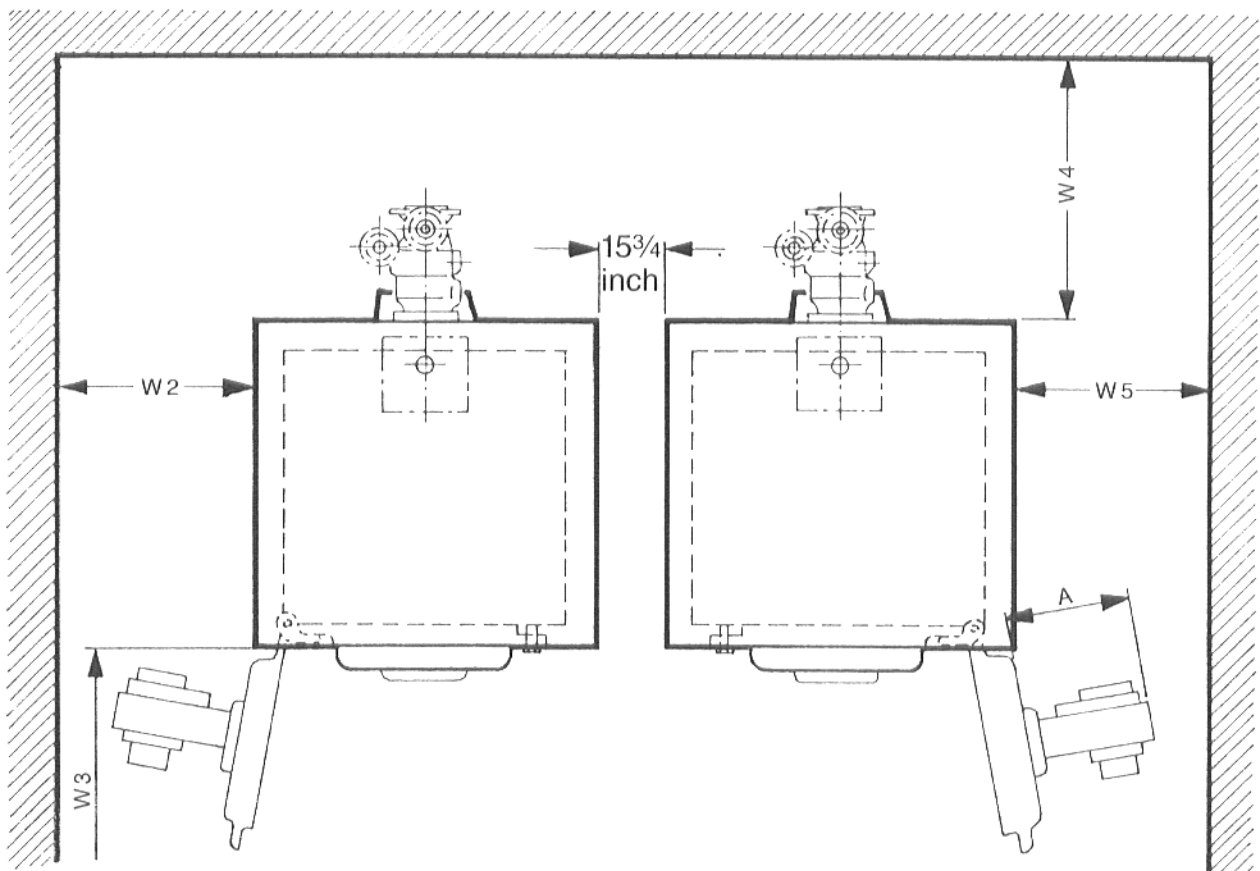


Fig. 6

Boiler foundation

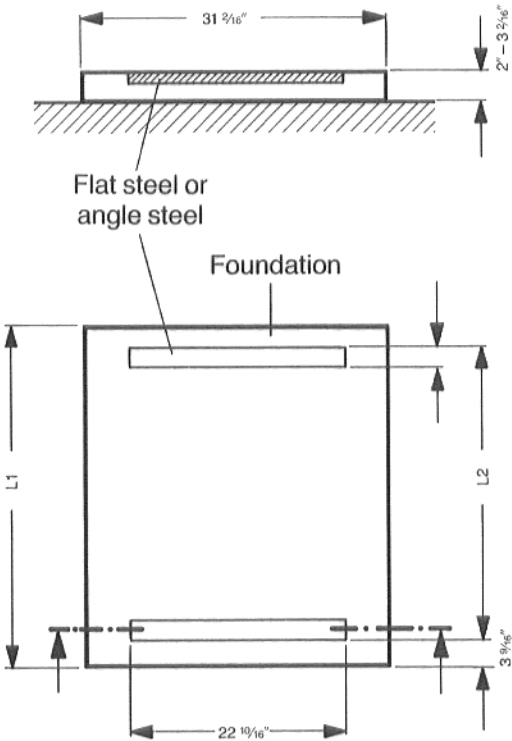


Fig. 7

Arrangement of sections in boiler block:

Rear section, middle section(s), front sections and flue box.

Follow direction arrows (fig. 8) during assembly and proceed according to table.

The front section is always the last section to be assembled. After the boiler block has been assembled the flue box is screwed to the rear section.

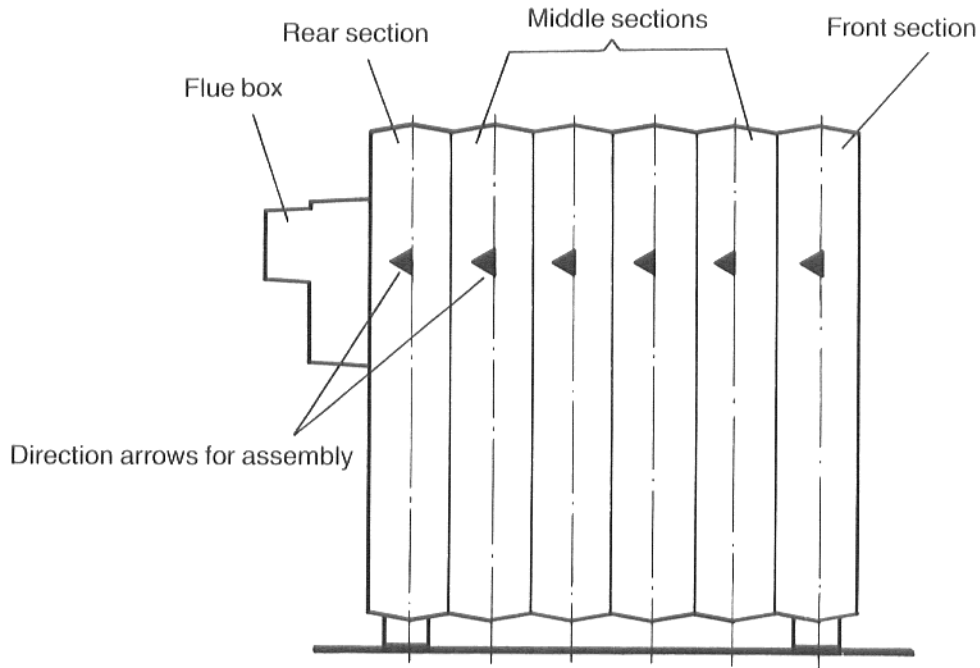


Fig. 8

No. of sections	Front sections	Middle sections	Rear sections
5	1	3	1
6	1	4	1
7	1	5	1
8	1	6	1
9	1	7	1

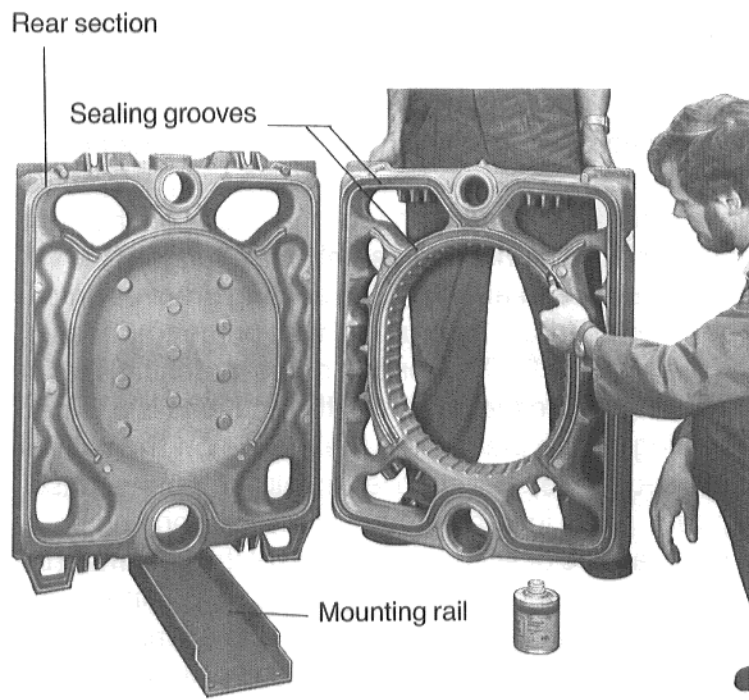


Fig. 9

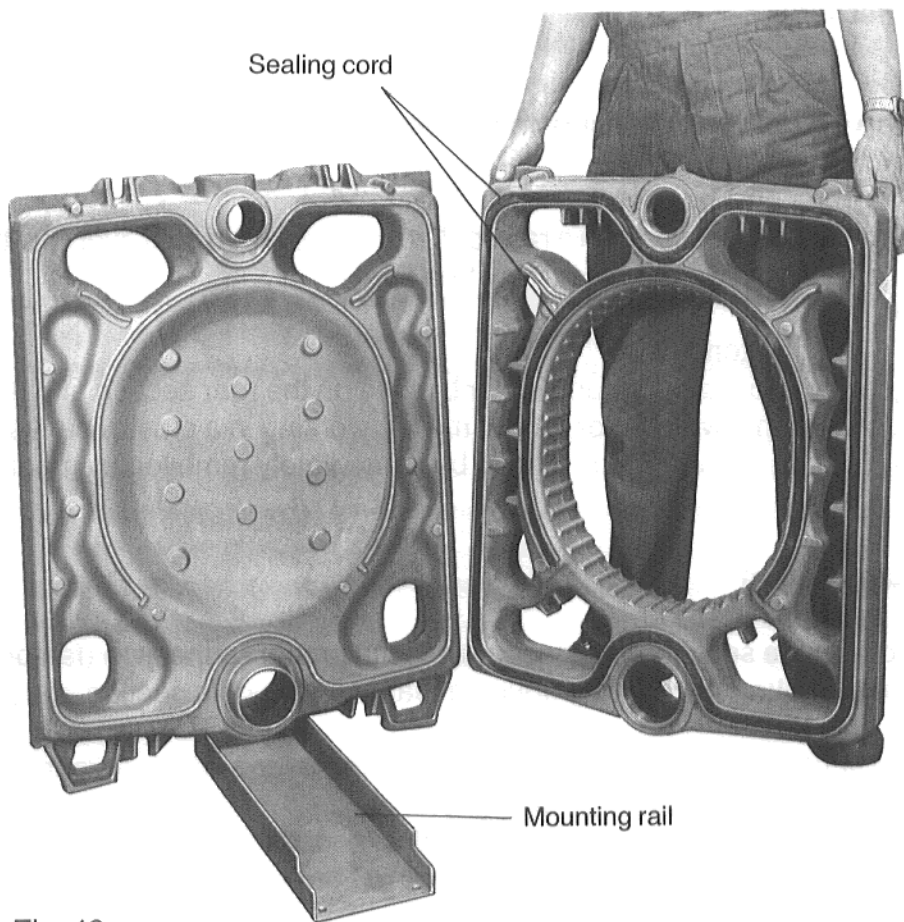


Fig. 10

3. Assembly of boiler sections

General

Before assembling the front and rear sections remove washers, nuts and studs from bosses.

For assembly of sections follow white **direction arrows** on top of sections on the right and left side. The arrows point to the rear. The method of assembly is a tongue and groove system. Make sure that all parts are **clean** and **dry**. The sealing grooves, into which the elastic sealing cord will be inserted, must be brushed with primer (adhesive) along their whole length and width (see also fig. 9). The tongue of the matching section should also be coated with primer. Sealing inside the groove of the sections is effected via the sealing cord supplied. The sealing cord is placed into the groove **on the rear of the section only** (viewed in assembly sequence). It is supplied in rolls on a paper base. Remove the sealing cord from the paper, place into the groove of the section and press down lightly. It may be cut to length using a knife or scissors. The end of the cord must be placed so as to be in **direct** contact with each other. The sealing cord joint (beginning and end of the cord) must always lie **on top**. During the drying period of 5 to 45 min. the sealing cord may be inserted and the sections assembled. All fittings which have to be removed or opened for inspection, are provided with an asbestos-free stranded sealing cord.

Important!

While applying primer (adhesive) ensure good ventilation in the working area, in order to avoid any health hazards.

Assembly

Place **rear section** in position and ensure that it remains upright. Place mounting rail against rear section (fig. 10).

Preparation of nipples and bosses

First clean both nipples and bosses with a rag soaked in petrol, then coat evenly with red lead oxide. Before applying oxide drain off any free floating oil.

Nipple insertion

Nipple size: top 57/50; bottom 82/50.

Insert nipples squarely into the upper and lower bosses on the rear section and drive home with light blows from a wooden or rubber mallet, working in a crosswise fashion. If a burr was created during this operation it must be immediately removed by means of a file.

Select **first middle section**

Clean boss and coat with red oxide.

Coat sealing groove in the section to be assembled with primer (adhesive) (factory-supplied). Place **elastic sealing cord** into groove on rear of first middle section and press home lightly.

Place **first middle section** with its lower boss on mounting strap and join to rear section. Clean bosses and nipples and coat with red oxide.

Push nipples into upper and lower bosses of first middle section and drive home with light hammer blows, working in a crosswise fashion.

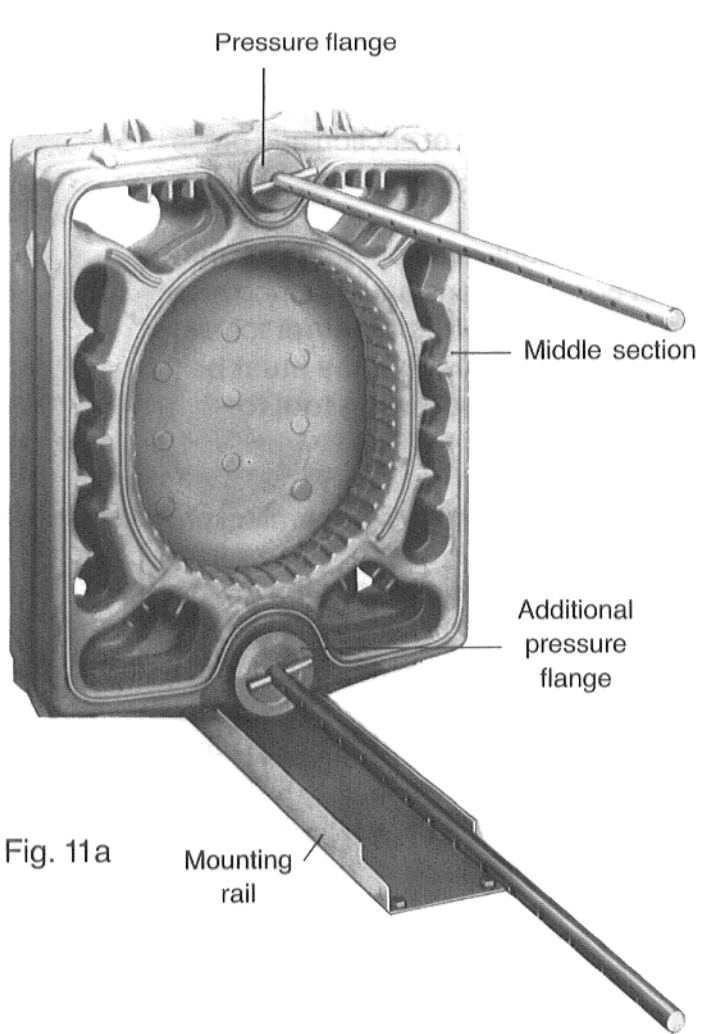


Fig. 11a

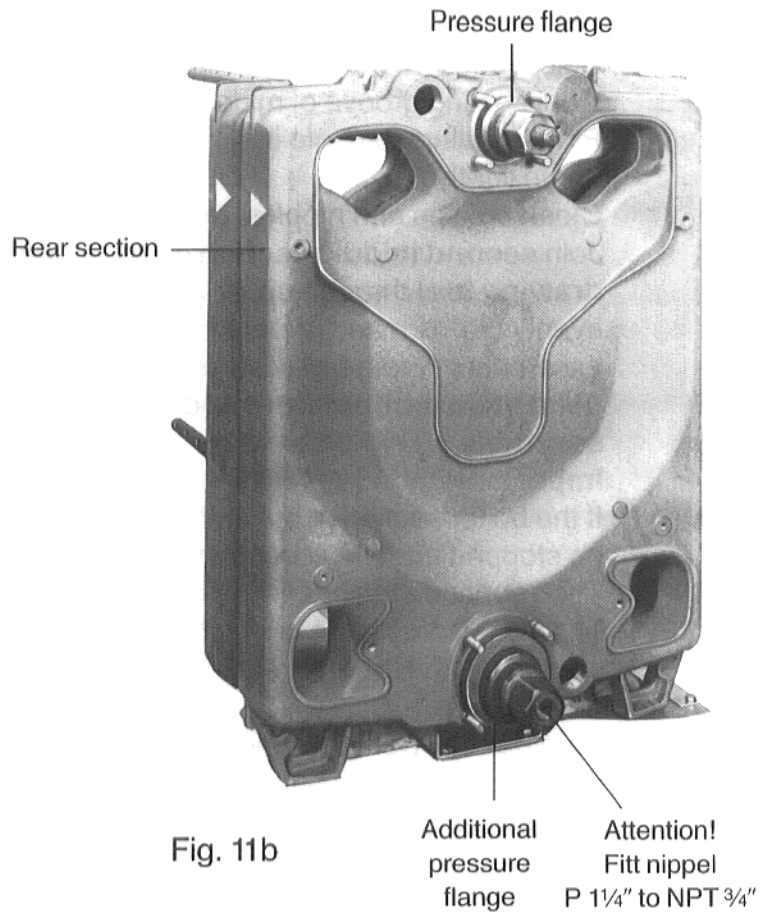


Fig. 11b

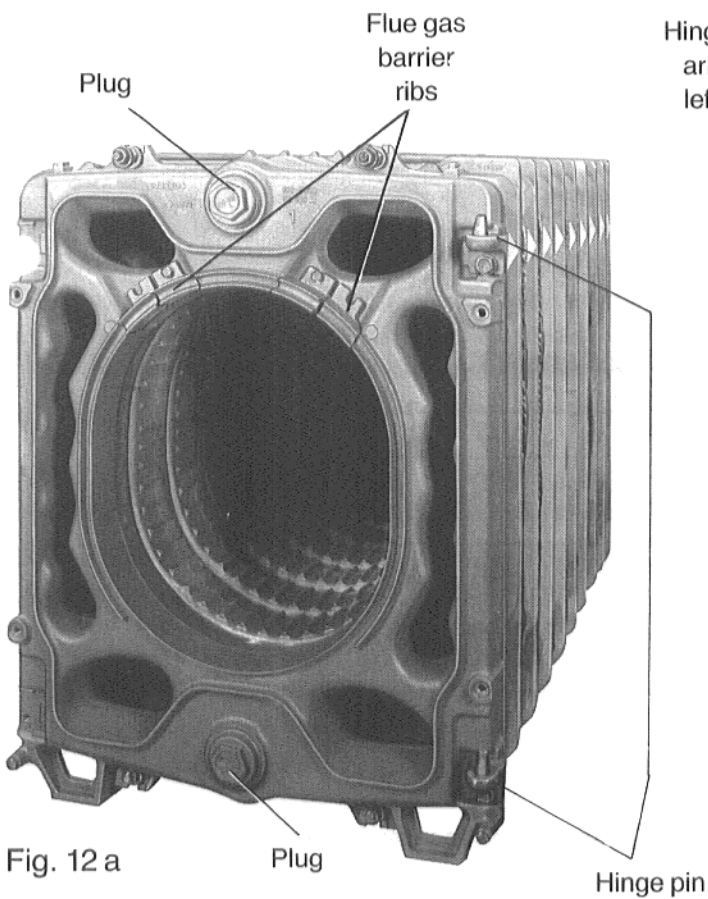


Fig. 12a

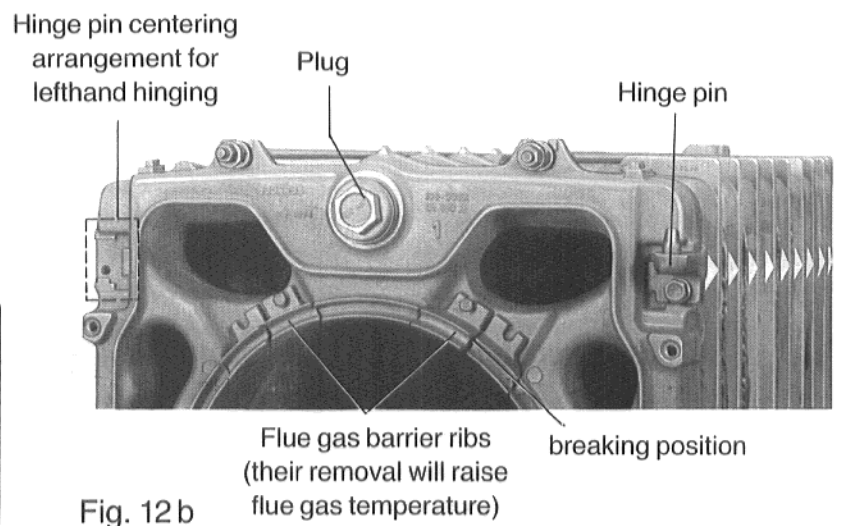


Fig. 12b

Select **second middle section**

Coat sealing groove of middle section (rear side) with primer (adhesive).

Place sealing cord into inner and outer sealing groove on rear of section and press home lightly (fig. 10).

Clean bosses and nipples and coat with red oxide.

Join **second middle section** on mounting rail to first middle section. Push **pressure-drawing tool** through upper and lower bosses of boiler sections and draw together evenly (fig. 11 a and b*). Never draw more than **two nipple joints together** for every assembly or pressure-drawing operation. **Additional pressure flanges must be used at the bottom front and rear when using a pressure-drawing tool for assembly.**

Important!

If the boiler sections abut at the bosses any further pressure-drawing operation must be stopped under all circumstances.

Then continue boiler section assembly as described for the first middle section.

The last section to be assembled is the **front section** (fig. 12 a). **When all the boiler sections have been drawn together, loosen both pressure-drawing tools, but do not remove.**

Flue gas barrier ribs were fitted in the factory (fig. 12 b). If part or all of these ribs are removed, the flue gas temperature will increase. Special breaking points have been provided for the partial removal of ribs (fig. 12 b). To separate them the barrier ribs must be placed on a base in such a way that the breaking point lies hollow. Lightly tap on the rear so that the ribs will break at the intended points.

If the flue gas temperature drops below 320 °F, the exhaust system must be arranged so as to avoid any damage from condensate.

Increase in flue gas temperature Δt in °F (fig. 12a and 12b)

No. of sections	5	6	7	8	9
Removal of 1/2 rib left and right (°F)	40	29	20	14	13
Removal of ribs left and right (°F)	135	90	68	52	45

*) Use of pressure-drawing tool for installation and repair. Two complete tools required for each boiler (see also fig. 1), each tool consisting of:
1 tie rod, 1 adjusting nut, 1 thrust block, 1 pressure flange, 1 counter flange, 1 cylindrical pin, 2 additional pressure flanges**), 1 ratchet spanner

) **Additional pressure flanges: to be applied only on the lower boiler boss, front and back.

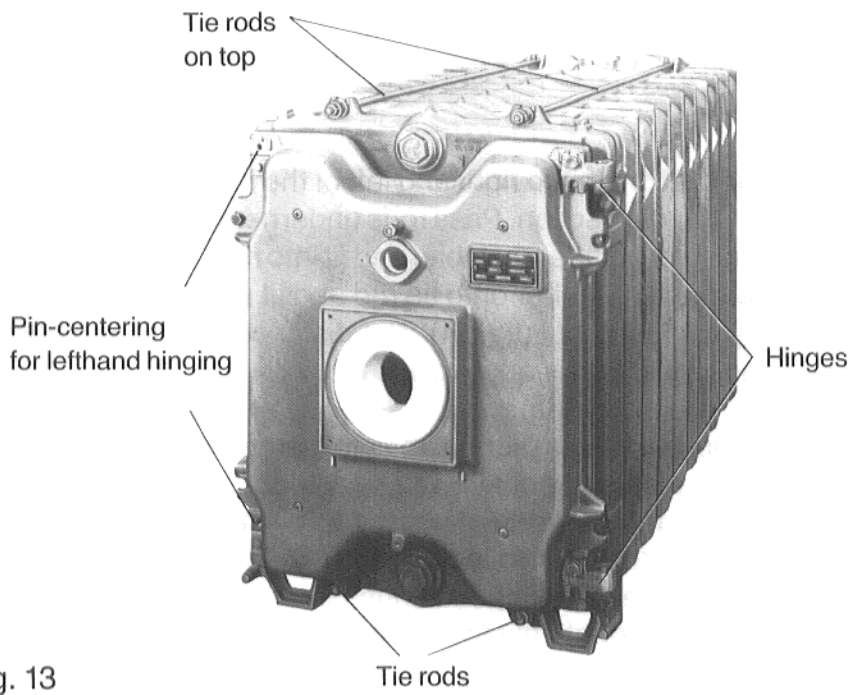


Fig. 13

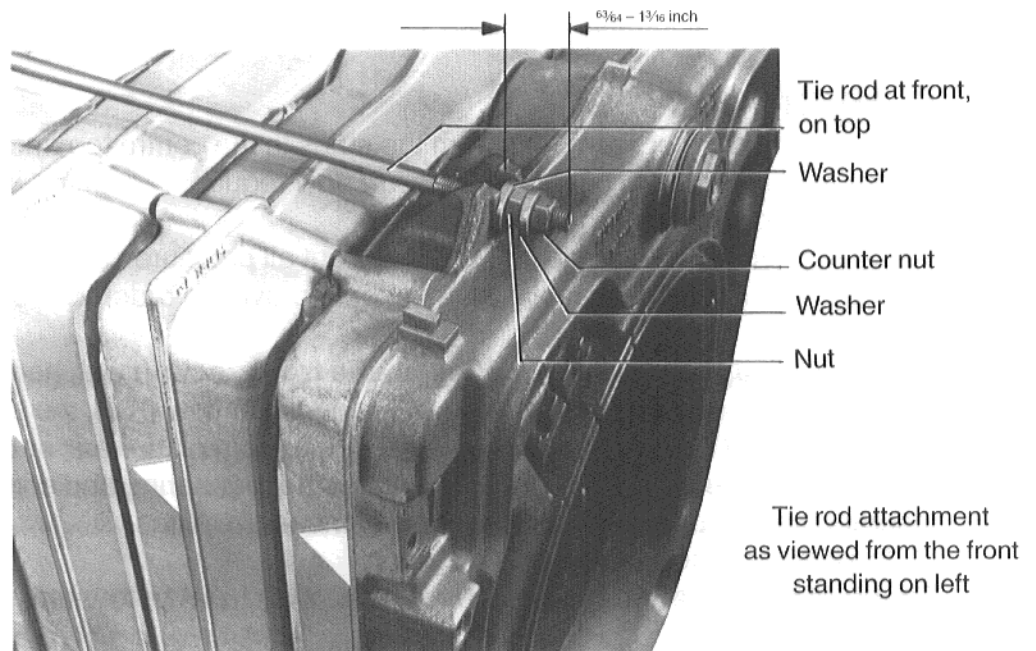


Fig. 14

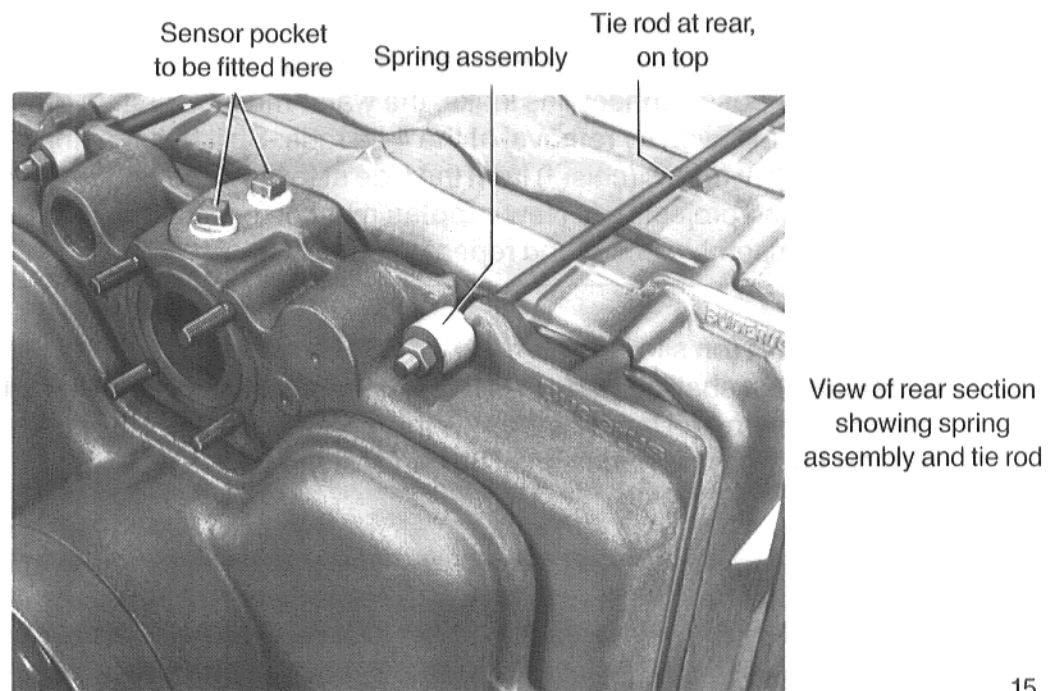


Fig. 15

Fitting tie rods

Fit **tie rods (2) top and bottom** to the right and left of the boss (fig. 13). They must extend from the front to the rear section. Pass rods underneath the boiler from the front or from the rear, depending on space available, and fit into recesses next to boiler feet. On **front side of boiler** push a washer onto tie rod and fit nut, push second washer onto tie rod followed by a counter nut (fig. 14). The distance from tie rod holder on the front section to beginning of tie rod is approx. 1 – 1³/₁₆ in.

On **rear side of boiler** push spring assemblies onto tie rods and manually screw on nut (use spring assembly as a whole only, do not unwind!).

Then tighten tie rod nuts on the rear side of boiler 1 to 1 ½ turns using a ring spanner (fig. 15). Level boiler on all sides, vertically and horizontally. After levelling the boiler block, check that the section feet make good contact with foundation by pushing a cardboard or paper strip underneath the feet. Fill any gaps between feet and foundation with metal strips or flat wedges.

Then **remove** pressure-drawing tools!

For burner door assembly see page 17 section 5: “Mounting and sealing of fittings”.

4. Hydraulic test

The nuts and washers removed from the studs in the centre top and bottom bosses before assembly of the boiler sections are now required.

Preparing for the leakage test

Whilst the hydraulic/leakage test is carried out all pressure controls and safety devices, which cannot be isolated, must be removed in order to avoid damage from overpressure.

- a) Blank the **upper and lower boss on the front section** with hemp and a plug.
- b) Blank the safety flow connection (SV) and boiler flow (KV), the safety return connection (SR) and boiler return (KR) at the bottom of the **rear section**. Also, on the top of the rear section, blank the opening for the measuring and control equipment by inserting sensor pocket or, as a temporary measure, plugs.

c) Important note on filling!

Filling of the boiler must be carried out slowly from below only via the fill and drain cock.

d) Venting of boiler:

During the filling operation the boiler should be vented at a point of the rear section, where the water-level will be highest, until water emerges.

If one of the boss connections leaks, the water must be first be drained via the fill and drain cock, followed by removal of the 4 tie rods. Split boiler at the point where it leaks by driving flat wedges (chisel) from the side at the top and bottom between the sections at the existing projections. **New nipples** must be used when re-assembling the sections. Assemble boiler and repeat leakage test.

Leakage test (on site)

A leakage test shall be performed. Testing pressure depends upon the pressure in the heating system and must be 3 times this pressure, but not less than 14 ½ psi.

A class 1.0 pressure gauge shall be used for the test.

5. Mounting and sealing of fittings

The burner door is supplied with hinges mounted on the righthand side. If the door is to be hinged on the lefthand side, the two hinges must be moved from the right to the left (fig. 13).

Important!: Hinges must be located at the attachment points of the centering projections. Screw hinge pins to front section on the righthand or lefthand side resp. (fig. 13). Fit burner door. Screw in studs opposite hinges. Fit nuts and tighten lightly. Screw in machine nuts on the side of the hinges. **Screws and studs must be tightened evenly.**

When opening the burner door undo only machine screws or nuts shown in fig. 17.

Return feed pipe

This is an important functional part of the boiler.

Screw four studs into the return connection flange (fig. 16). Insert return feed pipe from the rear into the lower boiler boss (remember to fit gasket). Make flange connection between boiler boss and return feed component using four nuts to be screwed onto the studs.

Screw **cleaning cover** to the rear section at the bottom on the left and right side (fig. 16). Tightly screw **flue box** to the studs previously screwed into the rear section. The **cleaning cover of the flue box** has been fitted in the factory below the flue gas pipe outlet (fig. 18).

Using 4 studs and SW1 13 nuts attach **boiler upper rear panel** to bottom of rear section, at the top above the flue box and to the left and right of the fire tube socket (fig. 19).

Fit door screen plate to burner door prior to installing the burner.

6. Burner assembly

The remaining parts of the boiler casing may be assembled immediately before start-up. The steel insertion plate must be drilled on site (oxyacetylene cut), according to the diameter of the burner tube.

Max. burner tube diameter of burner plate: 5 $\frac{1}{8}$ inch

Drill and tap holes for attachment of burner.

Screw **steel insertion plate** to burner door and seal using stranded sealing cord.

Assemble burner to boiler.

Flue pipe sealing sleeve

It is recommended to use a flue pipe sealing sleeve (fig. 18)!

Assembly sequence (if flue pipe sealing sleeve has been ordered).

Push flue pipe over socket of flue box (up to stop). Fit **flue pipe sealing sleeve** around pipe and socket so that it overlaps the joint. Fit and tighten clamping rings. One ring to be fitted around the socket, the other around the flue pipe. The ring which fits around the pipe should be pushed to the end of the sleeve.

The sealing sleeve should fit smoothly and tightly around the joint, after the clamping rings have been tightened. After a short period of operation the rings should be retightened.

Where a flue pipe sealing sleeve is not used, the joint between flue box and flue pipe should be sealed using boiler putty or similar packing materials. Absolute tightness of the joint is essential.

Where a flue gas temperature sensor is to be fitted into the flue pipe, a socket must be welded into the pipe on site. The distance measured from the flue box should be more than 2 x the flue pipe diameter. The sensor must not be insulated together with the flue pipe. It must be installed vertically and be exposed to the flue gas current over its full length. (see fig. 18).

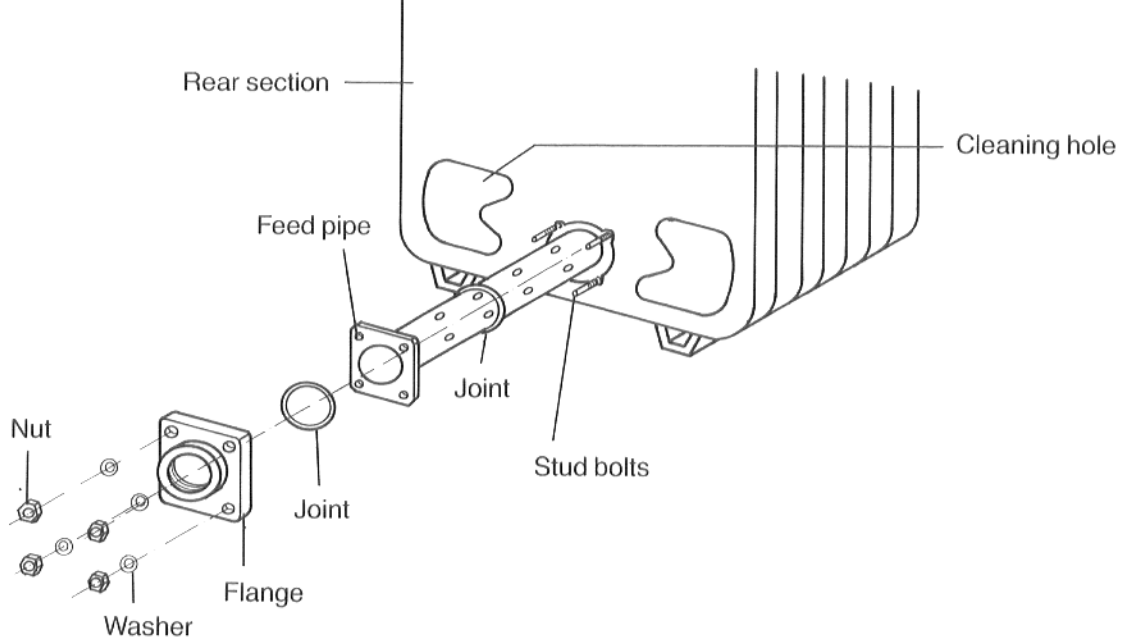


Fig. 16

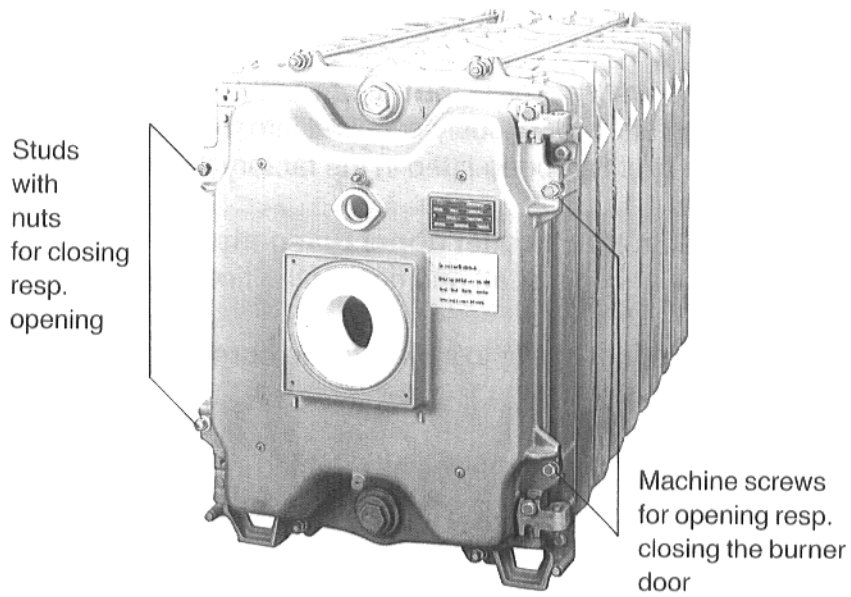


Fig.17

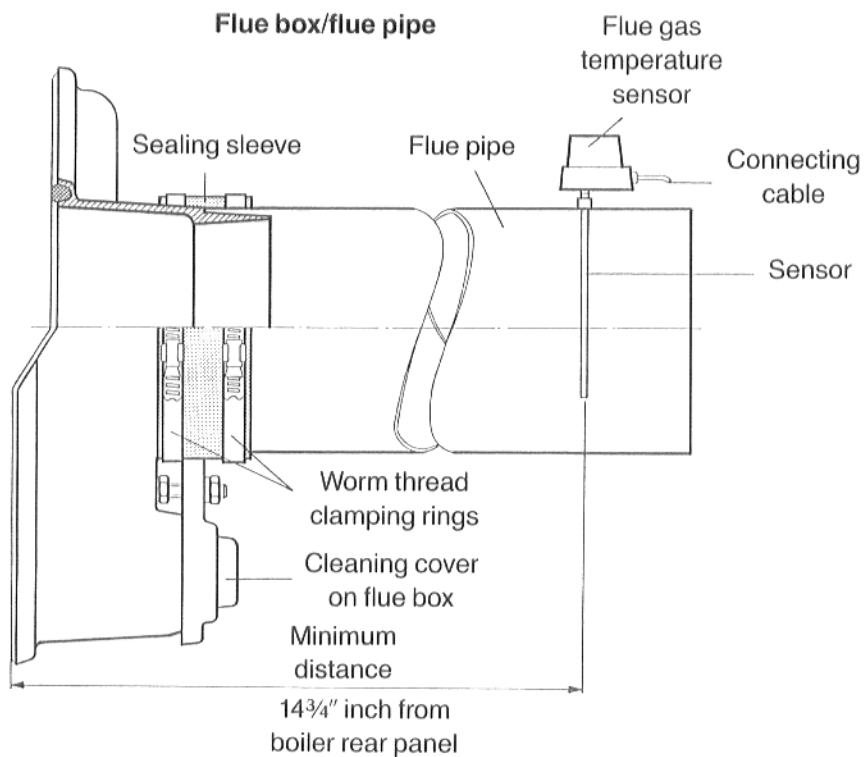


Fig.18

Boiler casing assembly – exploded view

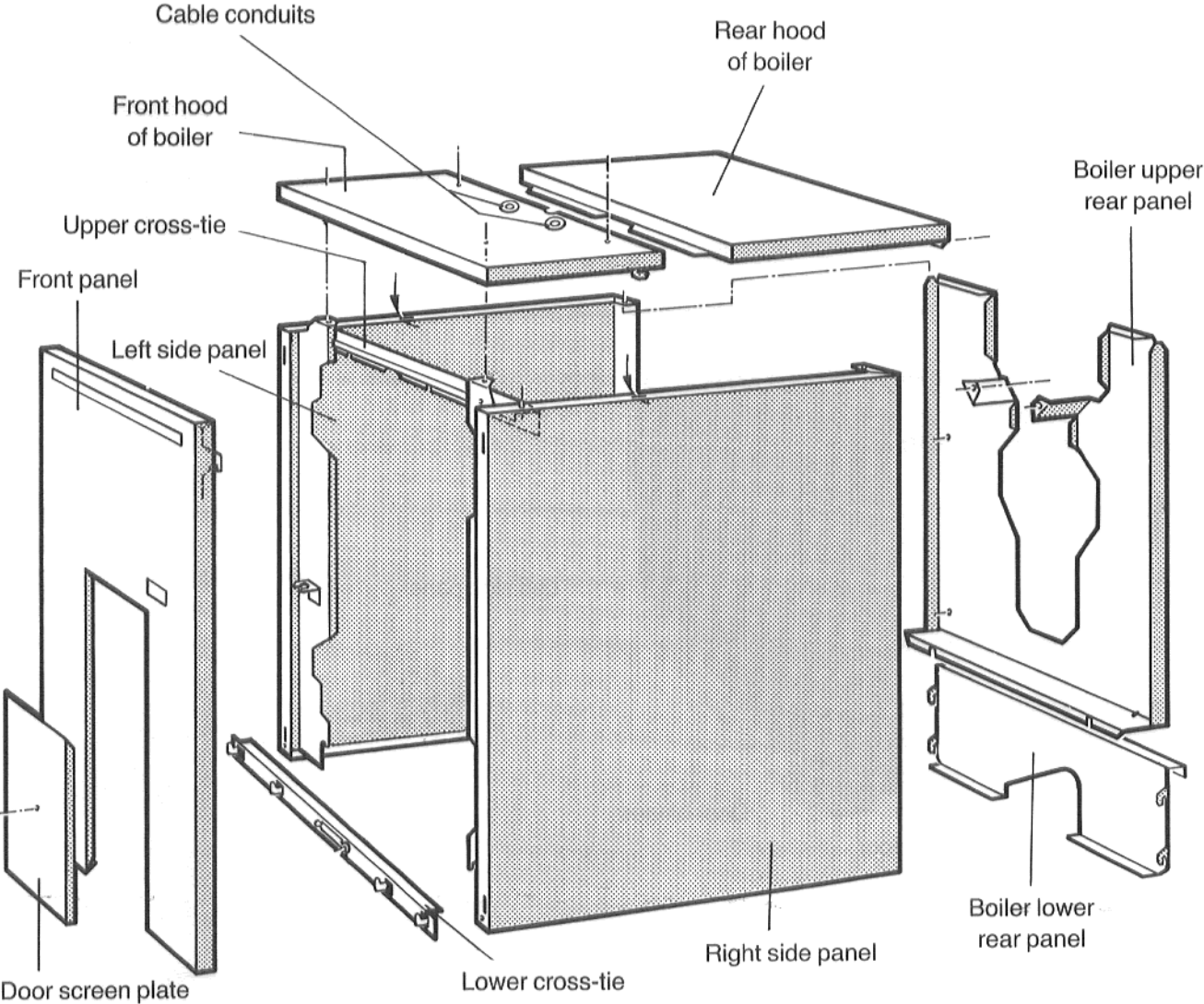


Fig. 19

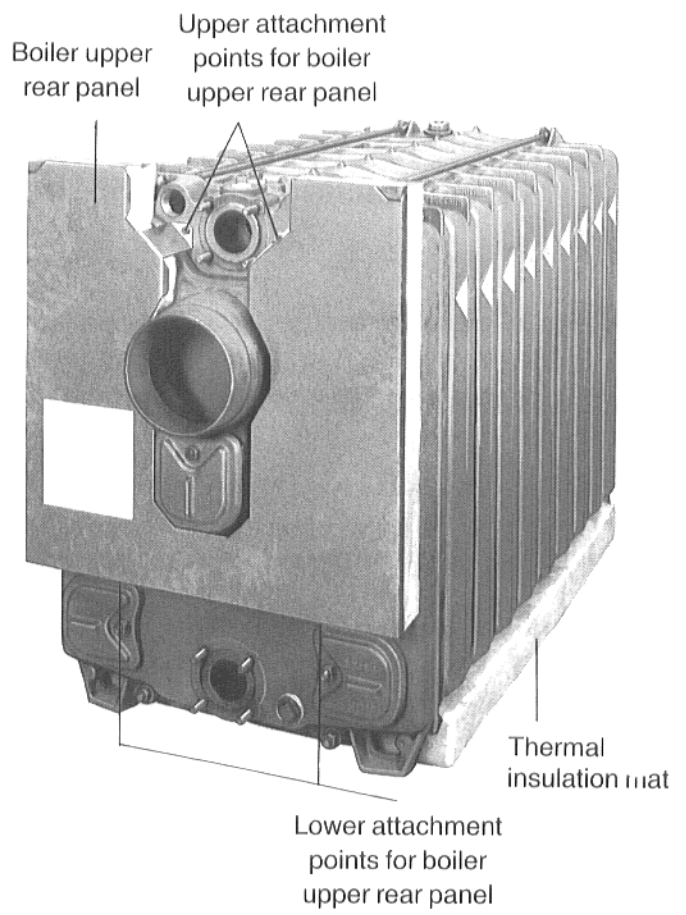


Fig. 20

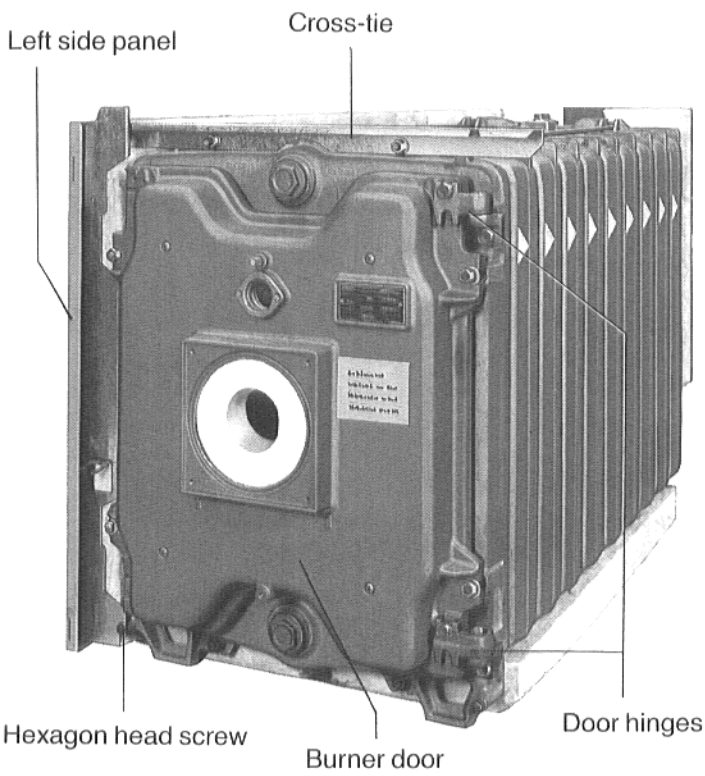


Fig. 21

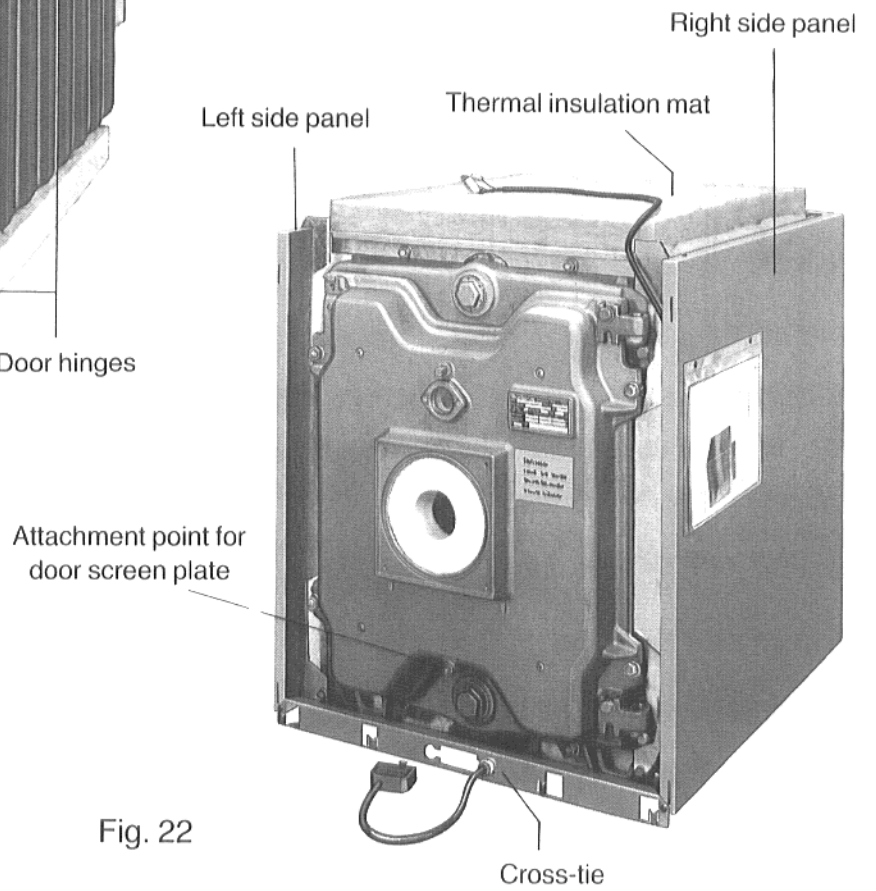


Fig. 22

7. Boiler casing assembly

Push **thermal insulation mats** from the left and right side underneath the boiler (with lining facing downwards, fig. 19).

For **boiler upper rear panel** see page 16, section 5.

For easy assembly of cross-tie open burner door (fig. 21). See page 18, fig. 17, for opening of burner door.

Push longitudinal slots on **upper cross-tie (fig. 21)** over the tie rod and screw down using counter nuts (see fig. 14). Using two studs with nuts and two SW 19 hexagon head screws, screw down burner door on the left and right hand side. Tighten screws evenly (fig. 21). The studs should be inserted opposite the hinges.

At the rear, hook the top of the **left side panel** into the metal of the rear panel casing, and at the front, hook the bottom over the hexagon head screws. Using two self-tapping screws secure the panel to the boiler rear panel (fig. 21).

Assemble **right side panel** following the instructions for left side panel. The protective pocket for the boiler documentation should be screwed to one of the side panels.

Fit **burner cable** with traction relief into one of the two circular cutouts of the lower cross-tie, after having checked that the traction relief is working. If it does not work, the burner cable must be arrested by turning the black plastic nut. Press cable into the cable clamps attached to the side panel. Further cable path see fig. 22.

Screw **lower cross-tie** to the bent-over edges of the side panels from the front on the left and right hand side (self-tapping screws).

Place **thermal insulation mat** on top of the boiler block with the slot for the boiler measuring point at the back (fig. 22 and fig. 24).

Feed **burner cable** through the rubber membrane conduit in the front hood of the boiler to emerge on the top (see page 19, exploded view of boiler casing).

Screw door screen plate (fig. 19 and fig. 22) to centre of burner door with bent-over edges facing outwards (above the burner cable traction relief). Fit to burner door prior to installing the burner.

Insert chamfered hooks of **boiler front hood** into the slots in the side panels. Push hood down at the front and, using two self-tapping screws, secure to the upper cross-tie.

Hook **boiler front panel** into the left and right side panels at the top and into the cross-tie at the bottom.

Hook **boiler lower rear panel** into the left and right side panels.

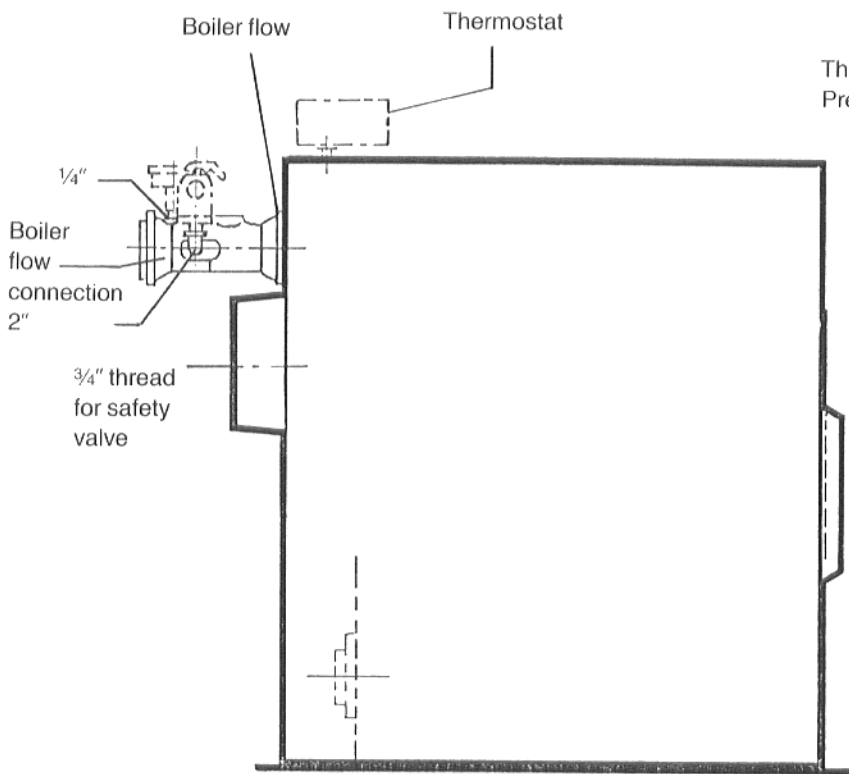


Fig. 23

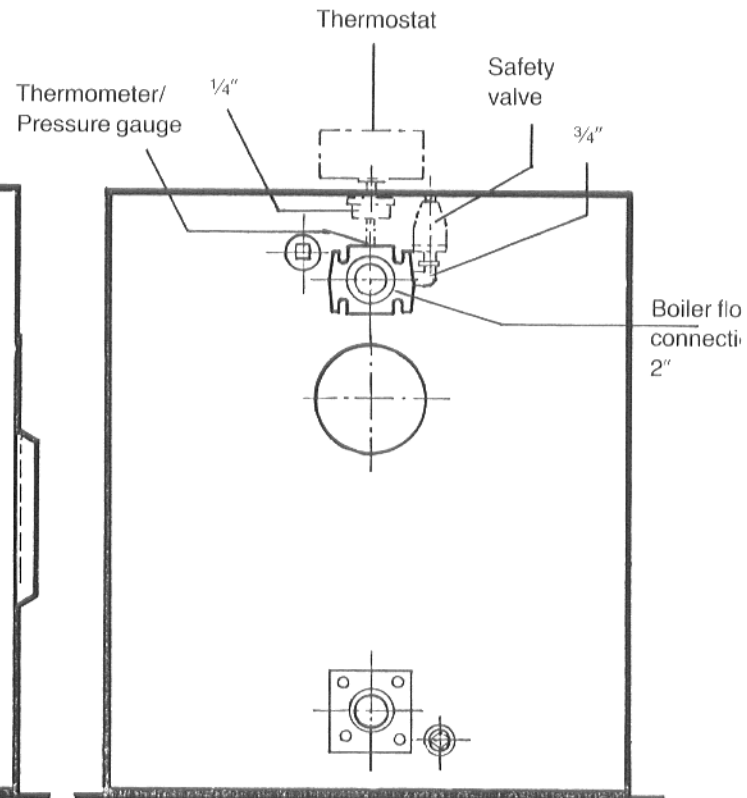


Fig. 24

Assembly of Boiler Flow Connection

Put flat gasket onto boiler flow connection of the rear section.

Put boiler flow connection onto the headless pins screwed into the rear section.

Attention!

Take care that when installing the boiler flow connection the lateral connection with 1/4" NPT thread shows upwards and the 3/4" NPT thread shows towards the right (seen from the back). Fig. 23 and 24.

Assembly of Thermostat

Release rear boiler hood (see page 19).

Seal in sensor pocket of the thermostat into the boiler rear section (Fig. 23 and 24).

Re-place rear boiler hood.

Insert thermostat sensor into the sensor pocket.

Screw thermostat to sensor pocket.

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In the interests of technical progress we reserve the right to make production changes and improvements without prior notice.