

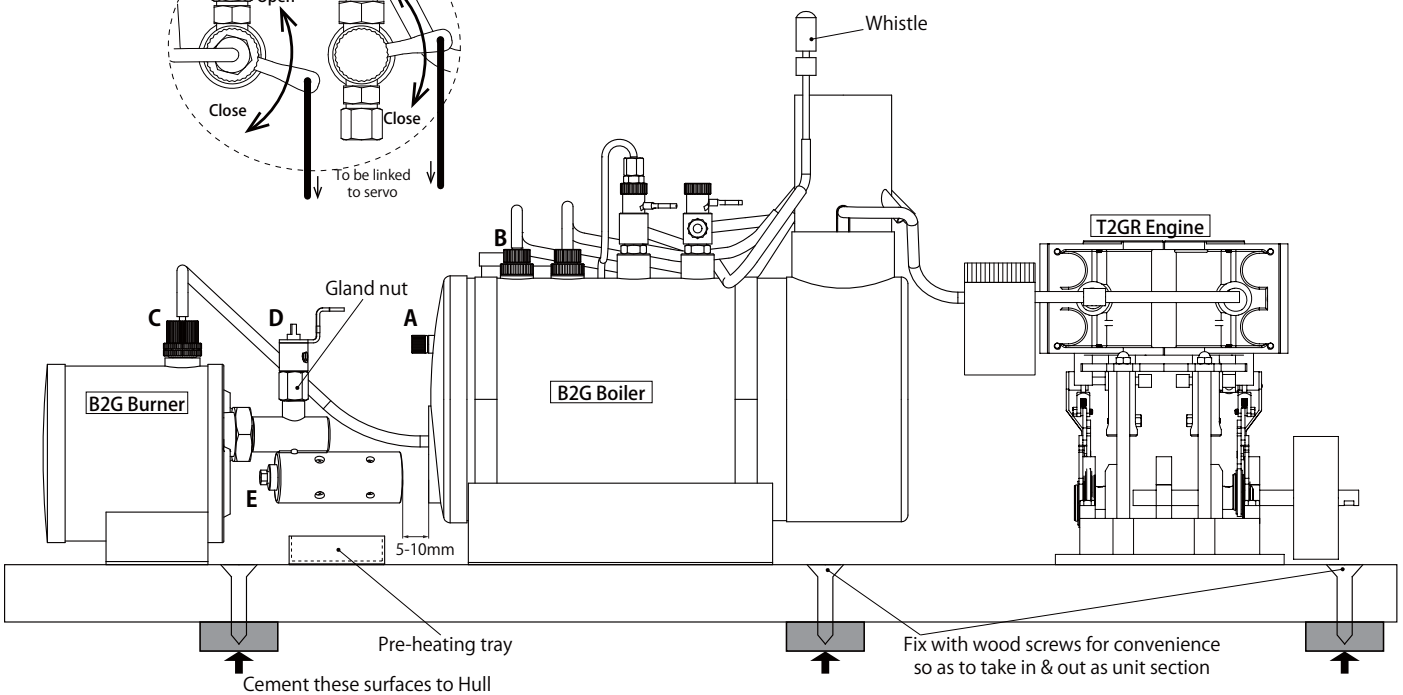
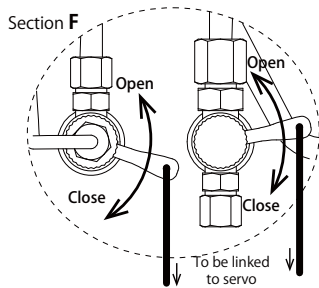
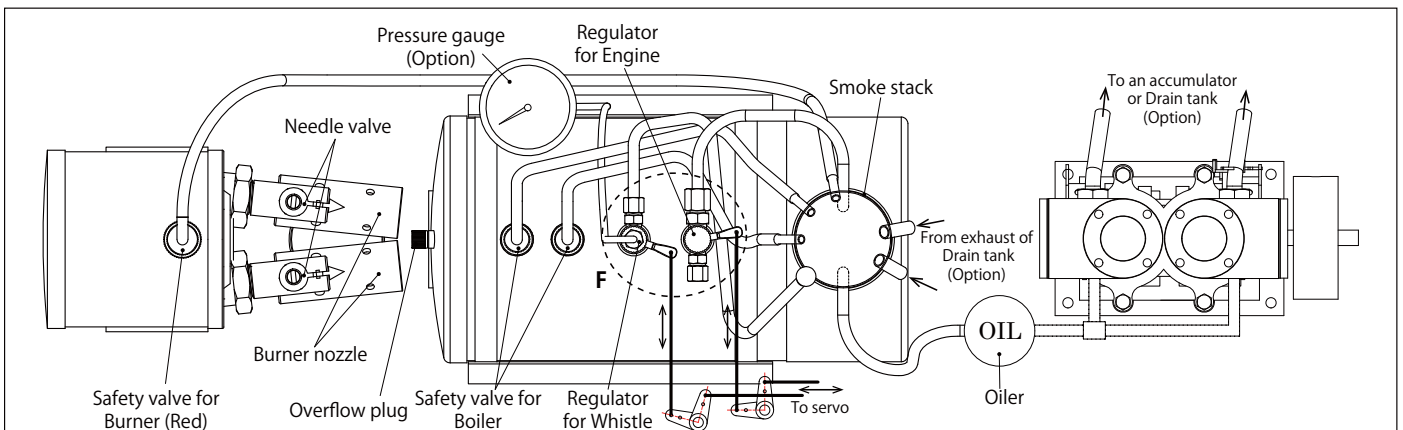
# INSTRUCTIONS

## For

# B2G BOILER & ALCOHOL BURNER

**Read carefully before operation.**

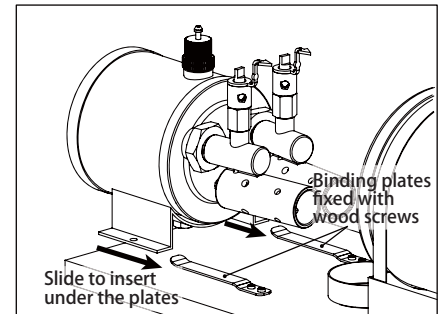
### Piping layout



## **Installing devices**

\* When operating your boiler for the first time, do not connect it initially to the engine. There may be foreign matter in the boiler which could damage the engine. First flush out the boiler for about ten minutes and drain hot water through valve port [B] before the initial operation .

- (1) Place the boiler, burner, and steam engine on a flat surface. Then fix the boiler and steam engine with wood screws. The burner should be fixed by burner binding plates attached to the surface.
- (2) Connect each section by rubber tubes and metal pipes referring to the figure.



## **Preparation for operation ♦1.**

### **Boiler**

- (3) Remove the overflow plug [A] and the safety valve [B]. Fill water through the port of [B] till water comes out from the port of [A]. Placing a towel under [A] is recommended so as not to wet the surrounding area.
- (4) Then fix [A] and [B] back to their original position by fingers. Do not use wrench or pliers. ♦2.
- (5) Keep both regulators closed until "Steam up" below is completed.

### **Burner**

\*Use only alcohol (methanol) for fuel. DO NOT use other fuels such as gasoline, paint thinner, petroleum, etc.

- (6) Close the needle valve[D] using the attached handle. If not closed, alcohol will drain out. ♦2.
- (7) Remove the red safety valve [C] and fill tank with fuel to 250cc (8.5 oz) using a measuring cup and a funnel. Do not exceed 250cc or the boiler may be damaged if the flame continues to burn after there is no water left in the boiler.
- (8) Then fix [C] back to the original position by fingers. ♦2.
- (9) Place the pre-heating tray under the nozzle and fill alcohol to about 50% in the tray using the attached squirter.

### **Steam engine**

\*Carefully read the instruction manual which comes with the T2GR steam engine before operation.

- (10) Fill the oiler with steam oil (Blue liquid). Lubricate metal, crosshead, crankshaft, eccentric, etc. as well as all revolution and movement sections with machine oil or 50 weight automobile engine oil.

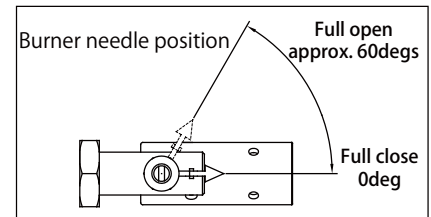
Preparation for operation is now completed.

## **Ignition of the burner ♦1.**

(11) Light the alcohol in the pre-heating tray. Just before the alcohol is consumed, open the needle valve slowly to about 15 degrees for burner ignition.\*If not preheated sufficiently, the alcohol will not be vaporized. In such cases, close the needle valve and repeat the process (9) above.

\*The maximum opening of the needle valve is about 60 degrees from full close. Adjust to the best position after 10 minutes' operation.

\*Usually it's not necessary to open needles of both nozzles. When you want greater steam for the engine, opening both needles is required.



**Steam up** \*Using the pressure gauge (option) is highly recommended.

(12) After the burner is ignited, it takes about 8-12 minutes to raise pressure sufficiently. When the pressure gauge shows 1.0~1.5kgf/cm<sup>2</sup>, open the regulator quickly to full open position and return to full close position to get rid of remaining air inside the boiler. Then pressure drops immediately and rises gradually again.

(13) When the pressure gauge shows 1.0~2.0kgf/cm<sup>2</sup>, Steam up is completed and now you can operate regulators to run the engine or use the whistle.

## **CAUTION**

- ♦1. Always keep fuel can, containers, and burnable material away from the burner. And keep a wet towel nearby for an emergency.
- ♦2. Excessive tightening may greatly shorten the life of packings (O-ring, gasket, or gland packing) and even strip or break the threaded part of the needle valve, safety valves, and overflow plug.
- ♦3. Always use fixed water and fuel levels for the boiler and burners.
- ♦4. Do not fill up the boiler with hot water.
- ♦5. If you restart the engine after stopping the burner forcibly by closing needle valve, there may be fuel remaining in the burner. In such cases, the burner can be re-lit immediately while the tank is still hot. But then **DO NOT add any fuel.**  
Or after it gets cold, **drain the remaining fuel** from the burner (remove the safety valve [C] and turn the burner upside down), and follow the process outlined in (3) to (13) above to restart.
- ♦6. In case of engine racing, adjust the rpm using the needle valve and the regulator. Operating the engine at high rpm can cause excessive wear or other damage.
- ♦7. As long as you feed recommended quantities of water and fuel, the flame will extinguish in about 25minutes. The quantities are measured to ensure that there will be water left in the boiler when the flame is extinguished. If excessive fuel is used, the boiler will become overheated after the water has been depleted and the flame continues. This dry superheating can break some welded sections and cause subsequent boiler leakage. In some cases, severe damage can result which cannot be repaired.

◆8. If you find such phenomena described below, there is possibility of dry superheating. STOP the operation immediately to avoid additional damage.

# Even though the heating power of the burner is still strong and stable...

- Pressure doesn't increase.
- Engine RPM decreases.
- Steam from the exhaust pipe is reduced.

# Pale flames are coming out of the stack.

# Abnormal smell or smoke is observed.

## NOTE

◇1. The safety valve for the boiler works at the pressure of 2kgf/cm<sup>2</sup>. The safety valve (RED colored) for the burner works at the pressure of 1.5kgf/cm<sup>2</sup>. The operator must pay close attention to pressures which exceed these norms.

◇2. Always confirm that the safety valves are functioning freely by depressing the springs when filling the water supply and fuel supply.

◇3. Closing the needle valve will extinguish the flame and shut down the operation.

◇4. Because carbon tends to collect on the nozzles, clean the nozzles after every ten operations using the attached wire.

\*Do not use a wire other than the attached one to clean the nozzles as any thick wire may reduce the heating power by widening the nozzle hole. Also, clean the nozzles from the nozzle end (boiler side). Do not loosen the screws of [E].

◇5. About heating power weaknesses, refer to the Causes and Countermeasures listed below

◇6. The wick end should always reach the bottom of the burner to ensure steady fuel flow and flame. If the wick does not touch the bottom, heating power will be reduced. In such cases, push the wick down gently using a wire or similar object. Standard burning time is about 25 minutes. If burning time is over 25 minutes, it means that heating power is reduced and the operator must find and fix the cause(s).

Possible cause	Countermeasure
Fuel absorbed moisture	Replace remaining fuel with new alcohol.
Excessive dust or carbon in nozzle	Clean using wire provided. After removing the gland nut and needle, pass the wire through the holes in the nozzle.
Foreign matter prevents valve from closing	When gas leakage is caused by something preventing the valve from closing completely, clean it completely

All specifications and models are subject to change without notice.



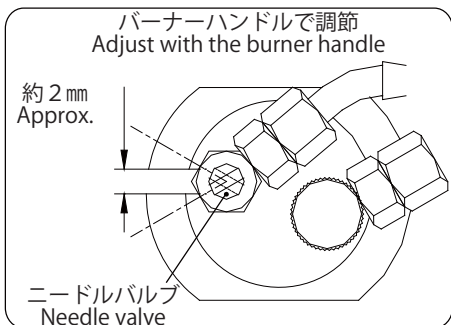
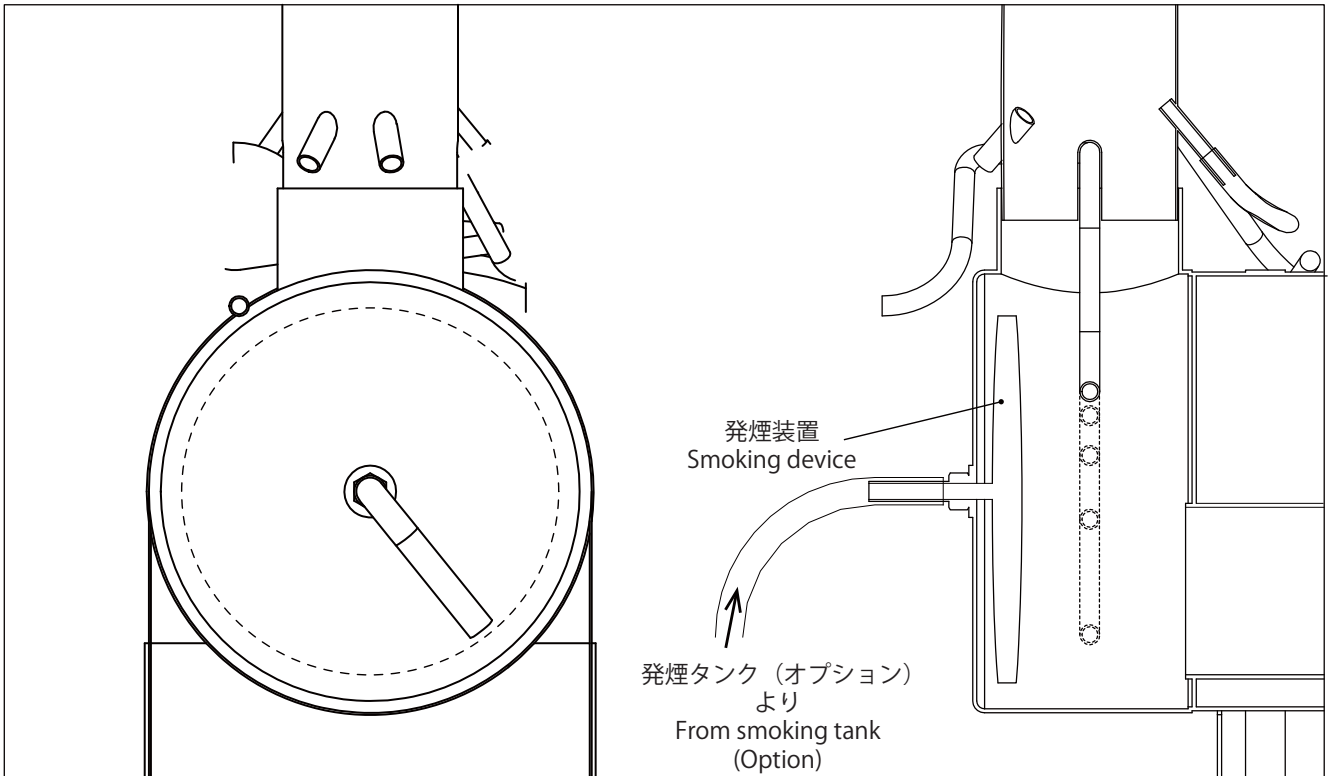
<http://www.saito-mfg.com>

**SAITO SEISAKUSHO CO., LTD.**

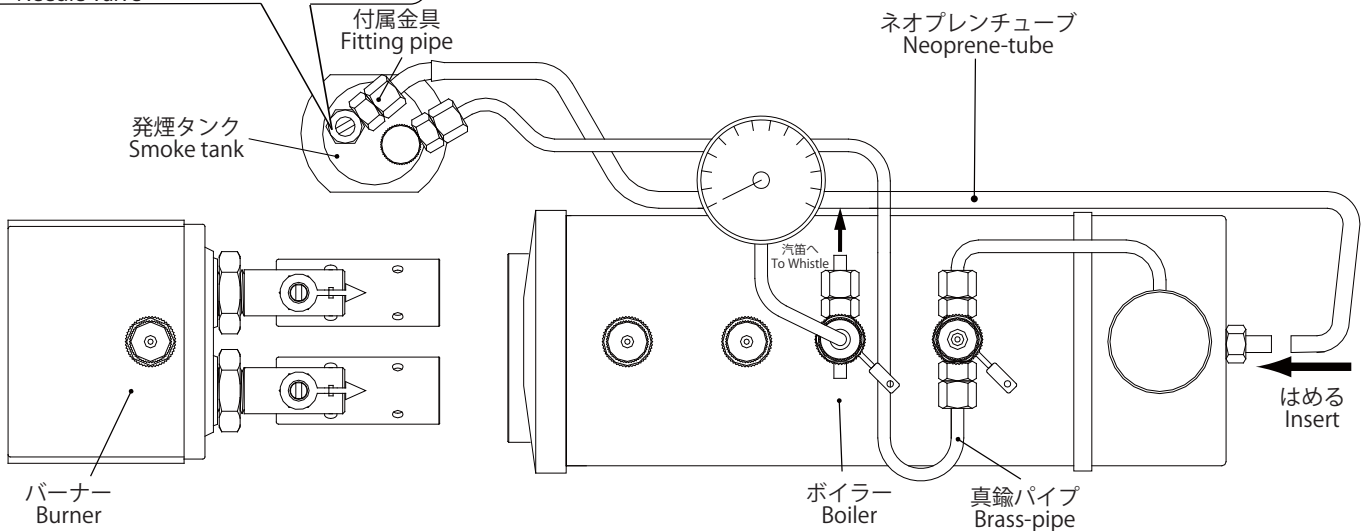
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# Smoking device for B2G



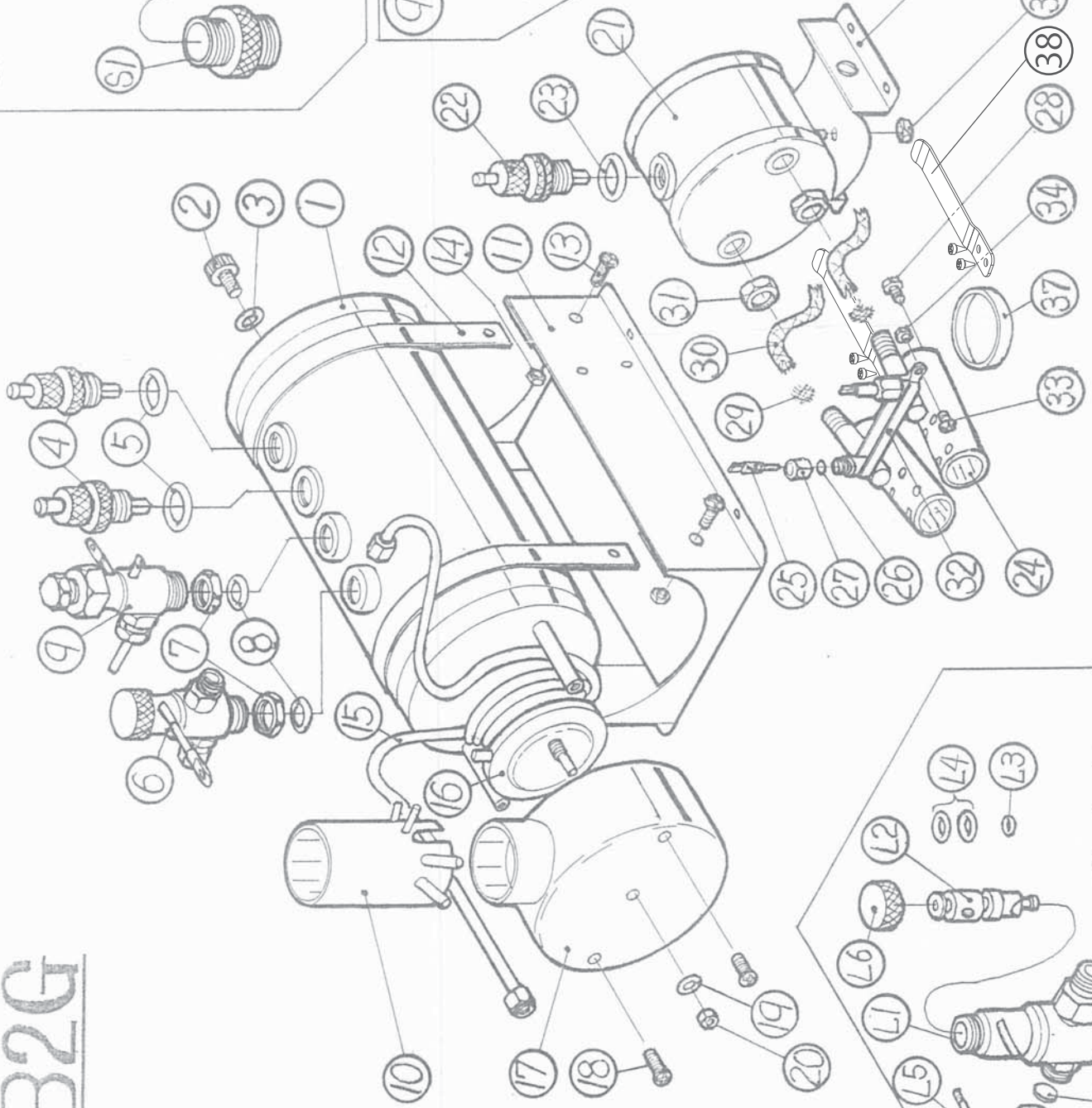
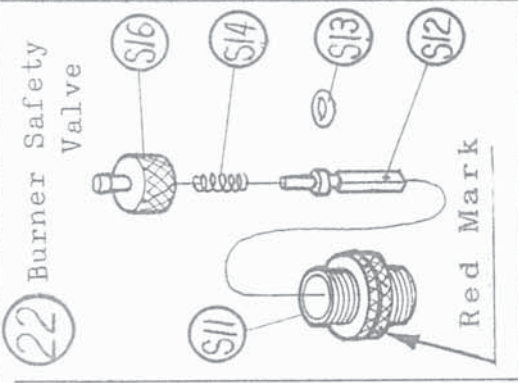
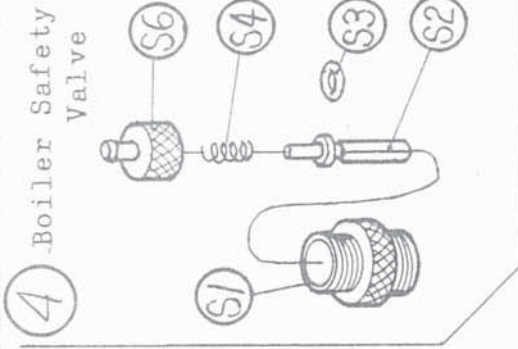
- ニードルバルブをあけすぎると、生ガスの発生と、燃焼の妨げになります。あけすぎないようにご注意ください。
- オイルは、専用のスモークオイルをご使用下さい。
- ニードルバルブはデリケートなので、過度な開閉は避けて下さい。
- 2回目からは、発煙タンク内のドレンを抜いてからオイルを入れて下さい。
- Too much opening of the needle valve causes raw-gas and discourage combustion. So take care not to open the nozzle too much.
- Use the dedicated oil for the smoke.
- The needle valve is very delicate so avoid opening too wide or closing too tight.
- From the 2nd operation, pour the oil into the tank after removing waste oil from the tank.



発煙タンク接続図 For B2G  
Fitting of the Smoke tank For B2G



# B2G



## Part List for B2G

NO		Description	Q'ty	NO		Description	Q'ty
1		Boiler body	1	11		Boiler mount	1
2		Overflow plug	1	12		Boiler band	2
3		O-ring P3	1	13		Screw M3	4
4		Safety valve for boiler	2	14		Nut M3	4
	S1	Safety valve body	2	15		Superheated tube	1
	S2	Stem	2	16		Smoke emitting device	1
	S3	O-ring P3	2	17		Smoke chamber	1
	S4	Spring	2	18		Smoke chamber fitting screw	2
	S6	Cover	2	19		Washer	1
5		O-ring P8	2	20		Nut	1
6		Regulator for throttle	1	21		Alcohol tank for Burner	1
	L1	Regulator body	1	22		Safety valve for burner	1
	L2	Valve	1		S11	Safety valve body	1
	L3	O-ring P2	1		S12	Stem	1
	L4	O-ring P3	1		S13	O-ring P3	1
	L5	Lever	1		S14	Spring	1
	L6	Cap	1		S16	Cover	1
	L7	Gland packing	1	23		O-ring P8	1
	L8	Blank cap	1	24		Combustion nozzle	2
7		Lock nut for regulator	2	25		Needle valve	2
8		O-ring P6	2	26		Gland packing	2
9		Regulator for whistle	1	27		Gland nut	2
	L11	Regulator body	1	28		Plug	2
	L12	Valve	1	29		Filter	2
	L13	O-ring P2	1	30		Suction string	2
	L14	O-ring P3	1	31		Lock nut	2
	L15	Lever	1	32		Band	1
	L16	Cap nut	1	33		Screw M3	1
	L17	Gland packing	1	34		Nut M3	1
	L18	Blank cap	1	35		Burner mount	1
	L19	Connecting pipe to whistle	1	36		Nut	1
	L20	Lock nut	1	37		Pre-heating tray	1
10		Stack	1	38		Burner binding plate	2