



V-2&OB-1 UNIT INSTRUCTION MANUAL

Thank you for purchasing SAITO product. This unit is the completed set of the steam plant. It includes Burner (Burning tray), Boiler, Oiler, Steam engine, and Drain tank that are all needed to be a power plant in a plate. You can enjoy handling the steam power plant easily with only water, fuel and some stuffs for safety.

NOTES for safety

- In operation for this product, you use fire and fuel. Take special care for burn injury or fire accident.
- DO NOT allow a child to operate it alone, make sure to do with an adult. And keep staying while fuel is burning.
- Make sure that there' re no stuff burnable and equip a wet towel or a bucket of water for safety.
- Make sure to fill up proper amount of water and fuel. DO NOT feed too much fuel to prevent boil-dry burning that breaks boiler.
- Check if the silicon tubes are surely connected to each nipple and pipe. If you operate even there are any loosening, it may blow off suddenly due to high pressure.
- DO NOT close your face or eyes to the engine and boiler while the engine is running. The flywheel splatters steam/hot water and oil content. And NEVER look into the smokestack during fuel burning.
- Since there a bit of toxic gas produced by the incomplete combustion of methanol, make sure to ventilate sufficiently, and DO NOT breathe the gas directory.
- During running or just after that, whole devices are very hot. DO NOT touch by your hands to each device.
- Please note that we cannot be responsible for any accident, injury, or trouble in the use of this product.

CONTENT

- UNIT (Assy; Boiler, Burner (Burning tray), Engine, Oiler, Drain tank, Pressure gauge)
- O-rings (For Spare)
 - For Drain tank cap / Overflow plug x2
 - For Safe valve x1
 - For Oiler cap x1
- Smokestack and fixation screw x1
- Steam oil (Blue) x1
- Machine oil (Brown) x1
- Measuring cup x1
- Dropper for fuel feed x1
- Infundibulum for water supply x1
- Hexagon wrench (Usually not use) x2
- Instruction manual x1

NEEDED BESIDES THE CONTENT

- Fuel alcohol
- Screw driver + (for smokestack fixation)
- Wet towel (for safe)

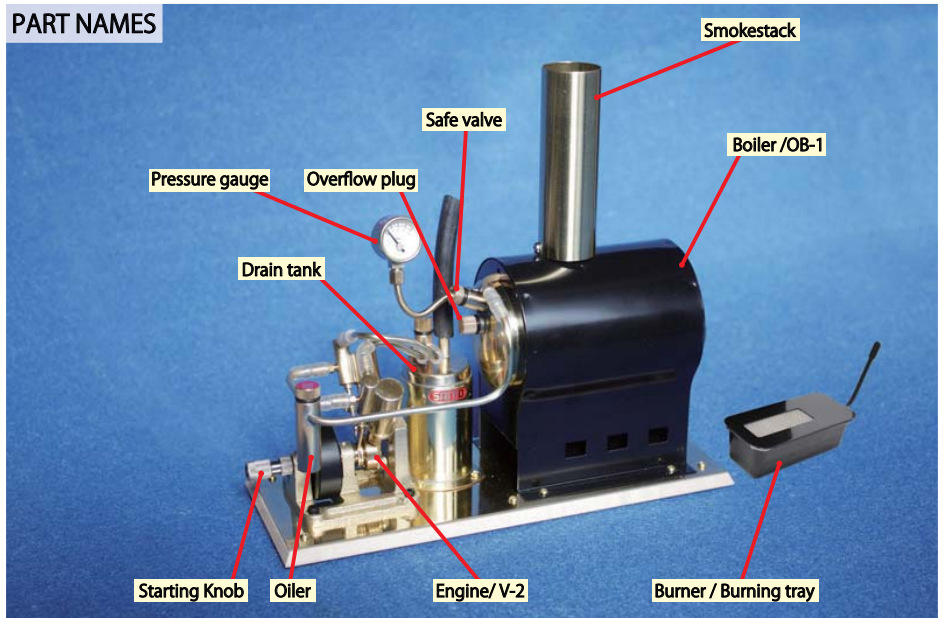
SPECIFICATIONS

Engine V-2	
気筒数 Cylinder	V-twin
気筒容積 Displacement	1.46cc
ボア Bore	8.8Φmm
ストローク Stroke	12mm
バルブ形式 Valve type	ピストン・バルブ Piston valve
Boiler OB-1	
給水容量 Tank Capacity	100cc
燃料容量 Fuel Capacity	15ccMAX
燃焼時間 Burning Duration	Approx.15min
安全弁作動圧 Safe valve WP	約1.2気圧(≒1.2bar)
Dimension	
全長 Length	210mm
全幅 Width	80mm
全高 Height	120mm 190mm (w/Smokestack)
乾燥重量 Dry Weight	Approx.790g

CONTENT



PART NAMES

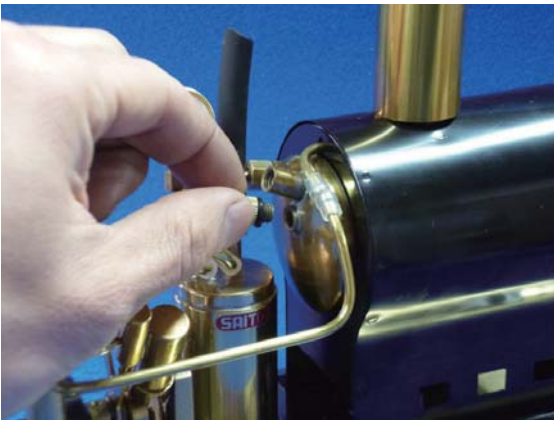


Preparation

A. Fixing the smokestack



1. Fix the smokestack to the boiler with a fixation screw. Once fixed, it doesn't need to be removed.



3. Remove the overflow cap as well.



5. After filling up water, securely install two caps to their original position.
(Too much tightening makes Caps and O-rings worn.)

C. Preparation (Feeding Oils for lubrication)



6. Remove the oiler cap.

B. Preparation (Filling up water)



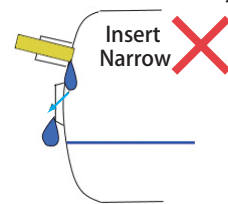
2. Remove the safe valve cap.



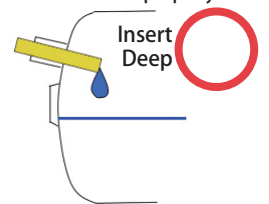
4. Insert the infundibulum deep into the port of safe valve and fill up water, till water comes out from the port of overflow cap. It can be filled about 100cc from vacant. You can cover under the port to wipe out overflowed water. Using pure water is the best but you can use tap water as long as it's clean. DO NOT use water includes lots of rust or chlorine, or hard water.

⚠ Unless filling water sufficiently, it may cause boil-dry burning that results boiler broken.

Water flows even if it hasn't fulfilled yet.



Water can be fulfilled properly.

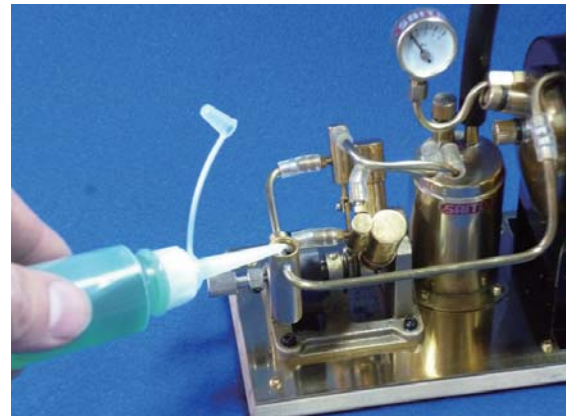


5. After filling up water, securely install two caps to their original position.
(Too much tightening makes Caps and O-rings worn.)

C. Preparation (Feeding Oils for lubrication)

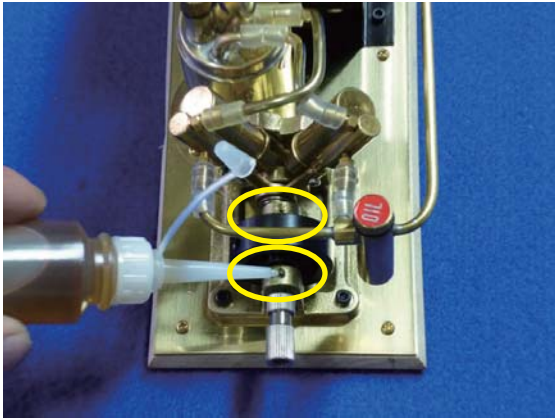


6. Remove the oiler cap.



7. Full fill steam oil (blue liquid) up to the oiler and reinstall the oiler cap.

⚠ Filling any different oil to the oiler causes engine break. It can be coagulated inside the cylinders.



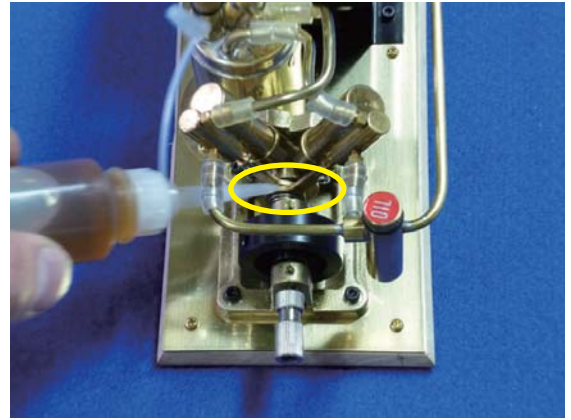
8. Feed machine oil (brown liquid) to the thin holes on the both side of pillow blocks.

D. Feeding Fuel

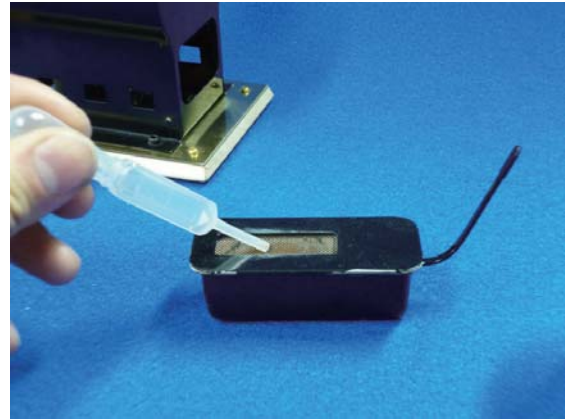


10. Tap the fuel alcohol 15cc with the measuring cup.

⚠ Exceeding amount of fuel makes burning duration longer and may result boil-dry burning to broke the boiler.

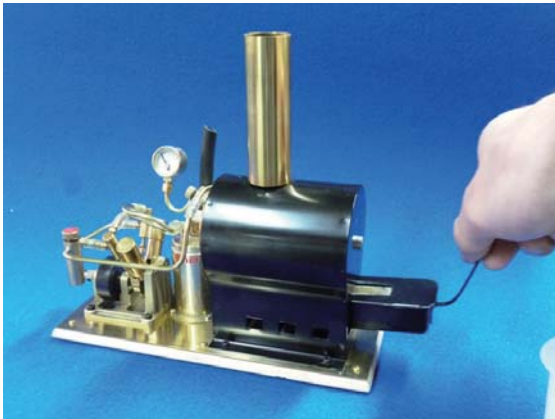


9. Feed the oil to the position turns at high revolution as the picture shows. It may splatter the oil with too much feeding.

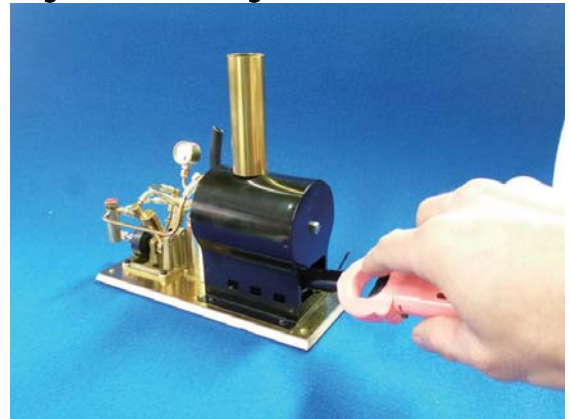


11. Feed the measured amount of alcohol to the burning tray with the dropper. When you spill over the fuel from the tray, wipe out with wet towel well before ignition.

E. Ignition ~ Starting



12. After feeding alcohol, set the tray under the boiler and securely insert into the deep. Now it is ready to ignite.



13. For safety, insert the long-nozzle type lighter to the burning tray and ignite. Pay attention as flame comes from alcohol is almost invisible.

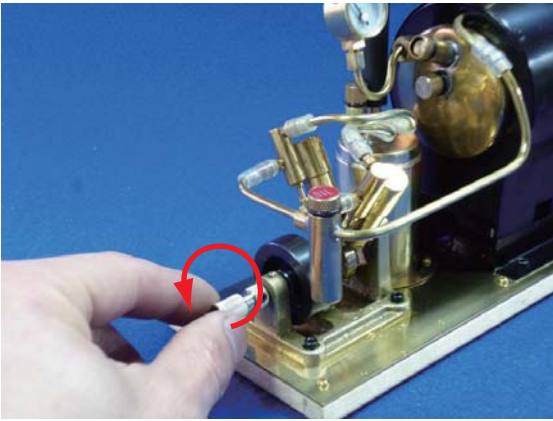


14. Though it depends on atmosphere, about 4-6minutes after ignition, water inside the boiler boil and start to raise the pressure. You will see steam and hot water leak from the cylinders but it is normal.

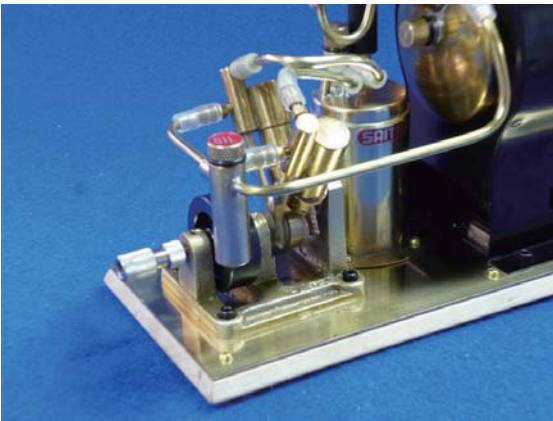


15. When the pressure gauge indicates about 0.5bar, it' s ready to start.

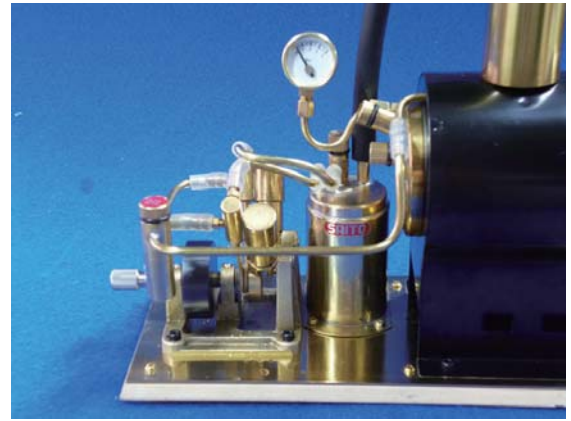
F. Start ~ Stop



16. Flip the starting knob to C.C.W. direction, then the engine starts running.



18. Fuel burns out about 15 ~ 17min after ignition, and engine stops naturally. During operation, preserve the notes at the beginning of this instruction, keep stay, pay special attention to fire accident, injury, and breathing combustion gas.



17. Once it starts, it continue to run keeping pressure around 0.5bar till fuel burns up. You can stop the engine by pinching the knob.



19. After running and it gets cool enough, remove the cap of the safe valve, overflow cap, oiler cap, and drain tank cap, and put the burning tray off. Then have the unit upside down to remove all liquid. (About disposal of the waste liquid, respect local environmental regulations)
After that, wipe well the unit body to clean up wet.

- If the flame burnt out by wind or you get flame out purposely while the fuel remains in the tray, DO NOT add further fuel into the tray. It elongate burning duration and may result the boil-dry burning. If the fuel remains in tray, ignite again to burn out the fuel completely so that the tray becomes vacant. Because of its structure, the fuel can't be disposed by getting tray up side down.
- When you operate again after the fuel burnt out, do the same procedure from the first for supplying water, oil, and fuel keeping the defined amount after the unit gets cool.
- If the engine is not operated for a long period of time, remove water, oil, fuel from the boiler, tray, oiler, engine, and drain tank. Store it in a clean atmosphere, not in a hot and humid air.
- This product has many parts or joints that is connected by solder or silver brazing so it is possible to be broken by a shock or uneven load. When you carry the unit, handle the base plate securely with both hands not handle the boiler, engine, pressure gauge or pipes.
- When you need the consumables such as steam oil, machine oil, and O-rings, ask the shop that treats SAITO products in your country.
- NEVER disassemble or modify the product since that may cause breakdown, fire injury, or fire accident in the worst case. When it gets worse, ask the shop that treats SAITO products in your country.
- Please notice that our guarantee will not cover any breakage or trouble on the engine caused by your disassembling or modification. If disassembling becomes necessary, ask repair for the shop that treats SAITO products in your country.

All specifications and models are subject to change without notice.



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

SAITO SEISAKUSHO CO., LTD.

22-7, 3-chome, Tokagi, Ichikawa-shi, Chiba prefecture 272-0024, Japan

Phone: 047-378-4156 FAX: 047-378-4155

SPECIAL CAUTION for operation

SAITO SEISAKUSHO CO., LTD.

Though this unit is small but it's a real steam unit that uses fuel and flame. Unlike an electric motor, it needs some procedure to operate, so we hope you will enjoy this treatment with care and safety.

1. NEVER look into the smokestack during the fuel burning.
2. DO NOT touch whole the unit during or just after running since it's very hot.
3. NEVER close your face to the engine since there spreads fine hot water and oil around the engine during running. Especially you should take care of the area shown the picture below.
4. By the reason above, it may soil the table, floor, wall, or clothes. So something to prevent dirt is recommended but be sure NEVER to allow fire spread.
5. NEVER use any fuel other than Alcohol.
6. Alcohol is flammable, so take special care for handling.
 - Make sure to tighten the cap of the fuel bottle every time after use.
 - In case you spilled out alcohol and fire spread, pour water or cover with wet towel so that flame will be out easily. Prepare wet towel and water for safety.

