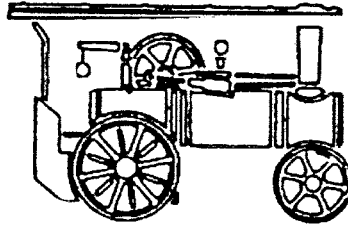


Operating Instructions
for a MAMOD
Jubilee Locomotive

Mamod
STEAM MODELS



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Operating Instructions - *Always adopt a regular routine when preparing your locomotive, or any other steam engine for that matter, and when shutting down after a running session. We would recommend, in keeping with similar locomotives, a simple routine, GAS, OIL, WATER.*

1. Fuel Tank Filling

Always ensure that the gas control knob is screwed fully home shutting off the gas. Undo the knurled nut connecting the flexible pipe from the burner jet housing to the main tank in the cab. Withdraw the tank assembly from the clip and it may be filled through the "lighter type" filler valve from a lighter fuel canister using a suitable plastic nozzle usually supplied with the can. Hold the supply canister and adaptor squarely over the tank filler valve. Ensure the adaptor is seated on the valve and press gently down until gas is heard to escape from around the adaptor. This means that gas should be going into the tank. When liquid gas appears around the adaptor it means that the tank is full and the supply canister should be removed. It may be that a spurt of liquid gas will appear around the adaptor when first attempting to fill the tank, in this case just lift the adaptor off and try again, making sure that the adaptor is properly seated on the filler valve.

This burner has been extensively tested with both butane only and butane/propane mixes. Butane is the recommended fuel but only in very cold conditions the butane/propane mix is more appropriate. When the tank is full restore to the clip in the cab. Check the O-ring on the flexible pipe, insert the end of the pipe into the tank connector, slide up the O-ring and tighten the knurled nut with the fingers only. The use of tools i.e. grips, pliers etc. are NOT necessary to achieve a gas tight seal.

ALL FILLING OPERATIONS SHOULD BE CONDUCTED OUTDOORS OR IN EXTREMELY WELL VENTILATED AREAS ONLY AND COMPLETELY AWAY FROM ANY NAKED FLAME OR SOURCE OF COMBUSTION.

L.P.G. is heavier than air and any excess will gather in open topped vessels and sink to the floor. All excess gas must be dispersed before any attempt is made to light the burner.

2. Lubrication

This locomotive has an integral displacement lubricator for the cylinder and valve chests.

Remove the top cap of the lubricator located just in front of the smokebox. Fill the lubricator with good quality steam cylinder oil, ISO460 compound T is recommended, up to the cross pipe which can readily be seen when the cap has been removed. Leave the cap off for a few minutes while you proceed to the next step of filling the boiler. Steam oil when it is cold is very thick and when poured or allowed to drip into a small lubricator will entrain air and leaving the cap off for a few minutes allows this air to disperse and you can add a few more drops to bring the level up to the correct position. Replace the cap, again the use of tools is not necessary as the cap is sealed with an O-ring and finger tightness will provide an adequate seal. All of the connecting and coupling rod linkages along with the eccentrics, axle bearings will need lubrication for every run and this can be completed with any light bearing oil up to and including ISO220 viscosity whilst steam is being raised.

3. Boiler Filling

Unscrew the safety valve from the boiler and using the funnel provided, fill the boiler with warm or hot water. Fill only up to the maximum marks on the sight glass bezel. Overfilling your boiler serves no purpose at all and increases the possibility of a condition known as priming which will push hot water not steam into your valve chests and cylinders causing a serious hydraulic lock which has the ability to damage the mechanical components of your locomotive. Do not forget to replace the safety valve and again finger tightness is adequate if the seals are maintained in good order. A hint for beginners is that many experienced operators use a plastic syringe for boiler filling. These are obtainable at a modest also stock small volume syringes suitable

SIGHT GLASS



Maximum marks.

4. Firing, Raising Steam and Running

It is a prudent locomotive engineer who carries a couple of wooden blocks to support his locomotive with the wheels clear of the ground (or rails) while he prepares for a run. With your locomotive so supported, close the regulator valve:- located immediately in front of the cab, by turning the valve wheel clockwise. Once again finger pressure is sufficient, excessive force will only damage the seals. Open the gas control valve slowly until a gentle hiss is heard from the burner, apply a flame to the lighting slot provided in the chassis frame and the burner will "pop" alight with a small blue flame attached to the burner tube. Allow things to warm up like this for 30 seconds and then the gas control valve may be opened until the burner starts to roar. The gas control valve should not be opened any more than 2 revolutions. Don't overdo this, the flame when viewed through the lighting slot will still be blue and will be just lifting off the burner tube surface. It is advisable after the first run to check the nuts on the cylinder chest and pinch tighten if necessary. Within a very short time (approximately two minutes) the safety valve will start to weep and there will be a small leakage of water from the cylinder exhausts. Crack open the steam regulator a couple of times by opening the regulator by turning the wheel anti-clockwise. Now is the time to go around and lubricate the linkages etc. With the locomotive now transferred to adjacent track and the safety valve blowing steam, push it either forward or rearwards for a least half a revolution of the wheels as this will set the eccentric drive pins at the limit of their slots and hence sets the correct valve timing. Open the steam regulator and the locomotive will move off in the direction you have set the eccentrics. At the start of each run, particularly if starting from dead cold, the locomotive may appear to jam up or behave jerkily, this is normal while condensate is cleared from the system. To reverse direction, close the regulator to stop the locomotive and push it for at least half a revolution of the wheels in the direction you wish it to go and reopen the regulator, the locomotive will move off again in the direction you have pushed it.

5. Shutting Down

When the gas has run out always close the gas control valve fully. Release all residual boiler pressure by operating the safety valve. Remove the lubricator cap and drain plug and allow the condensate drain away.

Replace drain plug, again the seal is an O-ring and finger tight is adequate.

6. Maintenance Tips and Fault Finding

From time to time check around your gas installation for leaks with a little soap solution around the joints. Firstly with the valve closed and then with the valve just cracked open a little way. Remember that gas will now be coming out of the jet as well. If all is not well, close the control valve and blow away any surplus gas. Replace any worn or split O-rings, all other leaks should be reported to your Mamod main dealer.

If the burner during normal use starts to flare up or is very uneven, it may be that the jet is blocked or partially blocked. **DO NOT UNDER ANY CIRCUMSTANCES ATTEMPT TO CLEAR THE JET BY POKING WITH WIRE OR ANY OTHER SOLID INSTRUMENT.** Carefully remove the jet and its housing and flexible pipe from the locomotive, it may then be blown through in the REVERSE direction with a compressed air line. If this fails then a new jet will have to be installed. The hole in these jets is in the order of five thousandths of an inch, in diameter and the burner has the potential to become dangerous if this hole is damaged. If you experience repeated problems with the jet being blocked, we recommend the use of our filter adaptor which fits all EN417 type cartridges.

If a follow-on run is planned, it may be that the gas tank seems to have a short duration. This is because the tank itself is very warm and cannot be filled to its full capacity. Liquid gas is forced into tank from the supply by the pressure of the gas above it and with a warm tank the internal pressure may be such that the full amount of liquid cannot be forced in to the tank. The remedy is to remove the tank from the locomotive and hold the casting under a cold tap to cool it down below ambient temperature. It will then be easy to refill to maximum.

BE AWARE AT ALL TIMES THAT THE LOCOMOTIVE IS HOT!

It is imperative that gloves be worn or the hands are protected by rags or cloth.

If you intend to carry on running, then again follow the procedure detailed above, if not then continue to shut down by draining water from the boiler through the safety valve hole, wipe the locomotive down with a clean cloth and oil up all of the linkages, wheels etc.

During running do not turn up the gas any more than is necessary to produce a satisfactory performance. It is wasteful of gas and inefficient to do so. Experience with the model will soon tell you the best settings for optimum performance and duration. It is part of the enjoyment to learn how to manage the resources of your locomotive.

Wash out the boiler at approximately 3 months intervals with a solution of hot water and lemon juice.

The burner should run out of fuel before the boiler runs out of water, but should the boiler run dry, **TURN OFF THE GAS VALVE IMMEDIATELY** and allow everything to cool down.

Make sure the gas valve is closed after every run and do not refill the tank until you are ready to use the model the next time. Do not store your L.P.G. in this unit.

WARNING

This model is fitted with a Liquid Petroleum Gas Burner (L.P.G.). These burners tend to be more efficient than the other methods of firing usually found in these types of models. It is essential to take extreme care with watching the water level in the boiler. These boilers are soft soldered and it is imperative the boiler is NOT boiled dry. There are always variations in burner efficiency and model performance etc. and as in the real thing you must learn to manage your boiler in a safe way. Every effort has been made to ensure the safety of the product but we have no control over the running and performance of your model unless the procedures recommended in the instructions are adopted.

HANDLING

Most parts of this locomotive will be too hot to touch with bare hands while raising steam, during running sessions and immediately after a run. If it is necessary to handle the hot locomotive it is recommended that it is lifted by the cab roof and front coupling or by front and rear buffer beams. Most experienced steam people always carry rag, cotton waste and/or wear gloves so that they may handle hot components and deal with any emergencies in as safe a way as possible. Hence this is our recommendation.

FOR YOUR OWN AND OTHERS SAFETY

DO NOT hold down or tamper with the safety valve in any way.

DO NOT remove the safety valve or any boiler connection whilst there is still pressure in the boiler. Always check for and relieve residual pressure by releasing the safety valve.

DO NOT allow the locomotive to run at excessive speeds, the real life prototypes of these locomotives always ran at an approximate walking pace. Regular use of excessive speed just wears your locomotive out sooner and wastes valuable fuel and steam.

DO NOT leave oil and water deposits from preparing and running the locomotive where yourself and others would be in danger of personal injury from slipping.

DO NOT ignore gas leaks from your gas system. Maintain the O-ring seals, tighten nuts correctly and if you cannot deal with a leak, take your locomotive to someone competent to rectify the fault before running your locomotive again.

DO NOT UNDER ANY CIRCUMSTANCES INVERT THE GAS TANK WHILST THE BURNER IS LIT. SEVERE FLARING FROM THE LIQUID GAS WILL BE THE RESULT.

TECHNICAL SPECIFICATION

Bore:	9.5mm
Stroke:	14mm
Cylinders:	2
Valve Type:	Piston
Valve Gear:	Slip Eccentric
Boiler Capacity:	Approx. 80mls
Operating Pressure:	1.13Bar (15psi)
Gas Capacity (max):	14.5c.c
Cylinder Lubrication:	Displacement
Cylinder Oil:	ISO460 compound T (recommended)

Every effort has been expended by Mamod Limited to attempt to ensure your safety and enjoyment and that of others in the construction of this locomotive, do not abuse it. Do follow the guidance given above, failure to do so will affect the warranty.