

Instruction Manual



EMMA Live Steam



ACCUCRAFT COMPANY
33268 Central Avenue
Union City, CA 94587
Tel: 510-324-3399
Fax: 510-324-3366
Email: info@accucraft.com
Copyright 2013

 **ACCUCRAFT TRAINS**
MUSEUM QUALITY BRASS MODELS



Additional notes

The safety valve is housed beneath the dome. This is a standard, pop-type valve that has been preset at the factory to blow off at 60 pounds per square inch. To get access to the safety valve, the saddle tank must be removed.

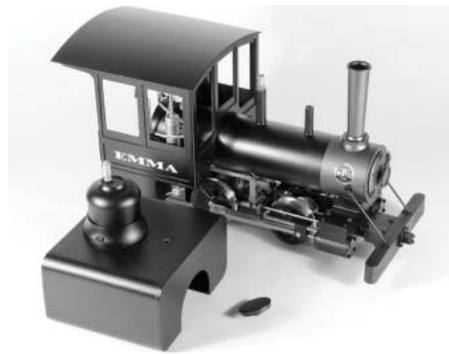


This is easily done by carefully unscrewing the dummy water-filler hatch in front of the dome. With that off, the entire tank and dome assemble can be lifted off. A dummy whistle is supplied in a separate plastic bag. Just screw this into the top of the dome.

Two plastic syringes are also supplied. The larger one can be used for water (boiler filling) while the smaller can be used to fill the lubricator with steam oil. Extra nuts, bolts, and glass for the sight

glass are also provided.

The pressure gauge in the cab has been placed forward of the backhead and faces out the right-hand window. Its position can be easily changed by unscrewing it hex bolt holding it to the turret, carefully bending the pipe to a new configuration, then replacing the hex bolt, taking care that the fiber washers are in place.



SPECIFICATIONS

Scale: 1:13.7 (7/8" = 1'0")

Gauge: N° 1 (45mm)

Wheel arrangement: 0-4-0T

Boiler: Single flue, gas fired

Boiler fittings: Safety valve, throttle, filler plug, pressure gauge, water glass, superheater

Fuel: Butane gas

Cylinder lubrication: Displacement lubricator

Cylinders: Two, double-acting D-valve cylinders, exhausting through the smoke stack

Reversing gear: Simple eccentric with reversing links, controlled from the cab

Blowoff pressure: 60 psi



Safety

For your safety, there are certain rules that should be observed, as follows:

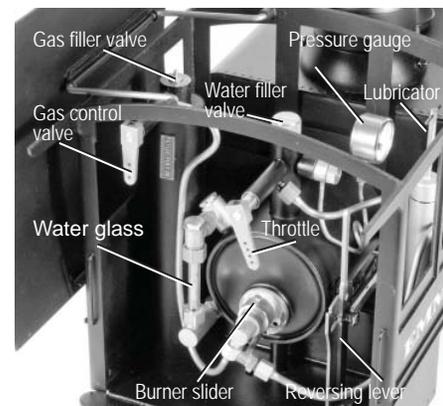
1. The safety valve under the dome has been set at the factory. Never tamper with the safety valve.

2. The firing system has been designed to use butane gas only. Never use any other gas, as the storage pressures can reach unsafe levels.

3. Always refuel the engine away from other working live-steam locomotives. The fuel-filling system allows a small amount of the gas to bleed off as the fuel tank is being filled. A passing engine can ignite this bleed-off gas, causing a potentially hazardous situation.

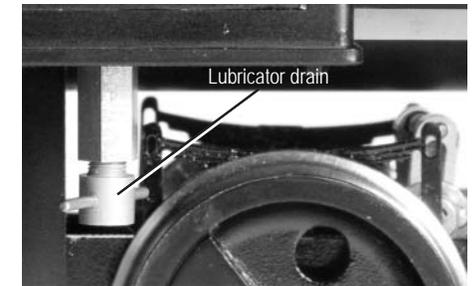
4. When lighting up, light your match first, then turn on the gas.

5. A steam engine gets hot. Be careful. Lift Emma by holding the body work when hot.



Preparing the engine

1. Oil all external moving parts with a high grade, lightweight machine oil like 3-in-1.



2. Emma's displacement lubricator is in the cab, on the right side. Remove any water from the displacement lubricator by unscrewing the drain screw on the bottom of the lubricator, leaving it open until no more water comes out. Then close it. Fill the lubricator up to the level of the steam pipe with proper steam-cylinder oil.

3. Fill the boiler with water through the boiler-fill plug on top of the throttle turret in the cab (make sure the throttle is closed). Fill the boiler until the level reaches 1/8" or so below the top nut of the water glass. Use only distilled water in your engine's boiler.

4. Finally, add fuel. Butane can be purchased in larger containers at camping-supply stores or in smaller containers at Asian groceries, but these cans will require special adaptors for filling. With the adaptor in place on the can, and the



can inverted, press the adaptor's nozzle hard onto the engine's gas-filler valve. You will hear the gas transferring and may see a little gas bleeding out of the valve. When the tank is full, the gas will begin to splutter and much more gas will escape the valve. When the gas tank is full, you are ready to fire up the engine.



Firing up

Emma's burner resides at the back of the flue, inside the boiler. Open the hinged smokebox door at the front of the engine. To light up, strike a match and hold it in the open smokebox door while simultaneously opening the gas valve in the cab very slowly until the gas ignites. You should hear the gas coming into the burner.

The fire should flash back into the back of the flue with a quiet "pop." If it tends to burn in the smokebox or in the forward

part of the flue, slowly close the gas valve until it flashes back to the burner. Don't let the fire burn in the smokebox—your engine will not run as it should and may be damaged. The flame should be bright blue and should burn steadily. If it sputters, adjust the gas valve accordingly.

If the flame looks yellow or green, adjust the slider over the air holes at the end of the burner in the cab.

The object is to run the burner at the lowest setting possible to operate the engine, thereby increasing the efficiency of the engine and the duration of the run. You'll get the hang of this with practice.

Allow the pressure to rise to at least 40 psi before starting. This should take 8-10 minutes or so. Air temperature will have an effect on this. It will take longer on cold days and less on hot. Butane gas turns to non-pressurized liquid at 32°F, so the engine may have difficulty on very cold days unless it is steamed up indoors.

Running

With the engine on the track, and without a train, open the throttle. Make sure the reversing lever is in forward position. Because the cylinders are cold, the hot steam entering them will condense into water and be exhausted through the stack. The engine will sputter and spit a little. To encourage it, a little gentle pushing may be in order.



When the cylinders have warmed a little, the engine will take off on its own, moving away smoothly. Once it is running smoothly, a train can be coupled on and the run can proceed. Since all of Emma's functions are controlled from the cab, it can be driven like a full-size engine, meaning that you'll have to stay with the engine through the run if you want to change its speed or direction. If you have a suitable track, the engine can be left to run on its own at a steady speed until the fuel runs out. As the gas tank in the cab heats up, you may find the engine picking up speed. Just turn the gas down a little and throttle the steam back. This is all part of learning how to get the best performance from your engine.

Emma was designed to run out of fuel before running out of water, thus preventing damage to the boiler. Care should be taken never to run the boiler dry. When the engine stops, the first thing to do is to close the gas valve. Then close the throttle. When the run is over and the locomotive has cooled somewhat, it can be lubricated, rewatered, and refueled for the next run.

Shutting down

At the end of the day's run, close the throttle snugly. When cool, the boiler filler cap should be loosened to relieve the vacuum that will be created in the boiler. This vacuum could pull oil from the lubricator into the boiler if the throttle is not closed.

After a day's operation in the garden you may find that your engine has a coating of steam oil. A simple wipe-down with a dry cloth is all that's necessary to restore the engine to pristine condition. This is best done while the engine is still hot. Wipe any grit and excess oil from the wheels and running gear.

The boiler can be drained of water, or not, as you please. Water left in the boiler will not harm it. The lubricator can also be drained and refilled with steam oil in preparation for the next run.

Notes on radio control

Although Emma was designed as a manually controlled locomotive, there is no reason why radio control (R/C) cannot be fitted with some ingenuity. A two-channel radio is all that's necessary—one for the throttle and one for the reversing valve. The gas valve should always be controlled manually. Small servos can be mounted to the floor of the loco and linked to the control arms. The receiver and battery pack might be fitted to the ceiling of the cab.

