

## Instruction Manual



## SOUTHERN PACIFIC 2-10-2 F4/F5 LIVE STEAM- BUTANE FIRED



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### Prototype Information

The Southern Pacific 2-10-2's were general purpose locomotives and were used system wide. The stand out news story about this class of SP loco was that in 1922 twenty 2-10-2's were shipped from Baldwin in one train across the country and that train was called the Prosperity Special.

The F4 and F5 class had 63 inch drivers, 29"x32" cylinders, weighted 397,900 lbs. and had a boiler pressure of 200 lbs.

F-4 #3680 is modeled by Accucraft as it appeared in 1953 after a shopping and had a 16,000 gal semi Vanderbilt tender added.

F-5 #3765 is modeled as it looked in 1955 with a clam shell stack and semi Vander built tender. The #3765 was one of the last 2-10-2's to be shopped.

Both these engines represent the Zenith of the 2-10-2 class on the Southern Pacific. The 2-10-2's were very popular on the SP and could go places that the bigger Cab Forwards could not. Many of the 2-10-2's were based on the SP's Shasta Division and were used as the main power on the original main line to Oregon from California over the Siskiyou mountains.



### NOTES:



### SP 2-10-2 F4/F5 Supplemental Information

After running these models on various radius it was found that on our test tracks this locomotive will negotiate 8 foot minimum radius. The manual states 10 foot minimum radius, and this should be regarded as a recommended radius, but they will go sharper.



### General information: Southern Pacific 2-10-2 Live Steam Model

Operating a model live steam locomotive is much different from running an electrically powered engine. It is a more hands-on, interactive experience.

The locomotive must be periodically fueled, oiled and watered. As supplied, the locomotive is manually controlled, which means that you must actually drive the locomotive using the controls in the cab, just as you would a full-size engine.

The performance of the engine is also unlike electric locomotives. The locomotive should pull a dozen or more standard-size freight cars on good, level track. Grades and sharp curves will diminish its capability. A good engineer will learn the engine's characteristics and idiosyncrasies over time, to get the best performance and longest duration from it.

### Safety:

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

1. The safety valve has been set at the factory to release at around 60 pounds per square inch of pressure. Never tamper with the safety valve.

2. The butane firing system has been designed to use butane only. Do not use an other fuel. Other fuel will create a dangerous condition, and will also damage the locomotive!

3. Always make sure the fire is out before refueling the locomotive. You need to be absolutely sure that there is no flame burning around the engine when refueling is done!

4. A steam engine gets hot, Be careful.

### Carrying the engine:

The locomotive and tender should always be carried separately because of their weight. We suggest carrying the locomotive to the track by supporting it underneath the wheels with both hands, as opposed to lifting by the pilot (which may not stand the stress) and rear beam.

For general carrying, the engine can be carried on a carrying tray with handles.



### Model Features:

This limited production model has been handcrafted for Accucraft Trains by BMMC, which is one of the most respected makers of large scale brass models. This museum quality model features:

- Detailed boiler with fittings, domes, pipes and handrails
- Operating steel drive rods, valve gear and cross heads
- Prototypical livery and lettering

The following part is packaged separately:

- 2mm hex head screwdriver
- 1.5mm Allen Wrench
- 2mm hex screwdriver
- Flat head screwdriver
- Philips head screwdriver

### Technical Specifications:

Scale/Gauge: 1:32, 45mm Gauge  
Total Weight: 18 lbs  
Length: 23 in.  
Width: 4.5 in.  
Height: 6.5 in.

### Tender Information:

Length: 15 in.  
Width: 4.25 in.  
Height: 6 in.

Recommend Radius: 3M, 10ft.\*

Boiler water capacity:  
to top of water glass: 450ml  
Tender water capacity: 600ml  
Alcohol tank capacity: 500ml

\*Be sure to leave at least 3" clearance (measured from the inner rail) to allow for overhang.

## Caution!

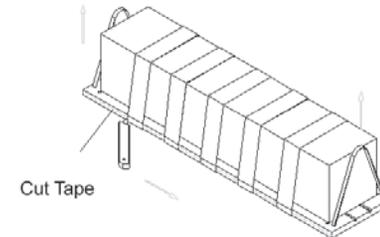
This model is an accurate replica of the original locomotive. It has sharp and moving parts. The locomotive drive rods are stainless steel with sharp edges.

**OPERATORS MUST NOT COME IN CONTACT WITH A MODEL THAT IS BEING POWERED AT ANY TIME. UNDER NO CIRCUMSTANCES SHALL ACCUCRAFT TRAINS BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING IN REGARD TO ANY ACCUCRAFT PRODUCT.**



### Please read following directions before unpacking your locomotive.

1. Remove foam around the locomotive. Slide the inner box cover to the side, and open the inside cardboard box with a cutting knife.



2. Place taped locomotive on a flat surface. Carefully cut the tape along the wood board side surface. Be sure to cut both sides of the wood board. Slowly lift the tape from the locomotive. Be very careful with small parts. Tape cannot be re-used to re-pack the model. Use new packing tape if necessary.



With careful adjustments of this valve, the engine will always have enough water to keep running for long periods of time until the tender water tank needs to be refilled. The tender is also equipped with the hand pump, which needs to be used to prime the axle pump. Only two or three strokes are necessary to prime the pump.

### Shutting Down:

To shut the engine down, simply close the fuel valve.

After the fire is out at the end of the run, open the blow down valve and leave it open. This will relieve the boiler of what little pressure remains. Because of the size of the engine, blowing down could take several minutes.

After a day's operation in the garden, you'll probably find that your engine has a coating of oil all over it. This is steam-cylinder oil that has been exhausted from the stack. 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 warm. Wipe any grit and excess oil from the wheels and running.



### Lubrication:

1. Oil all external moving parts of the engine and tender with a high grade, lightweight machine oil like 3-in-1. Don't forget the wheel bearings in the pilot and trailing trucks, as well as those in the tender. Don't over-oil; a tiny drop will do the job.

2. Place the engine and tender on the track and couple them together. The drawbar between the units has two holes. For tighter curves, use the rear hole. For wide-radius curves, the engine and tender can be coupled more closely together, using the front hole. Then connect the water feed, fuel and water return lines.

3. The adjustable lubricator located in the cab ensures the cylinders and valves are properly lubricated inside. As the steam passes through it, a small amount will condense into water. This water will sink to the bottom of the lubricator, forcing a similar quantity of oil into the steam line and thus to the cylinders.

Remove the lubricator cap and draw out any water from previous run with a syringe. Use only proper steam cylinder oil. Fill the lubricator, but leave a small air space between the oil and the cap.

4. Fill the tender with water. Open the throttle valve a little and pump water into the boiler. Fill the boiler until the water reaches the top of the glass. This is a BIG locomotive and it will take a lot of water. Do not overfill the boiler; there needs to be room above the water for steam to form.

Use only distilled water in your engine's boiler. Tap water contains minerals that will leach out, cloud the water glass, and ultimately affect performance of the engine.

5. The fuel tank is located in the tender beneath the oil bunker.

\*\*\*Butane gas can be purchased at the grocery store or at a tobacconist's as cigarette lighter refills. (Butane can also be purchased more economically in larger containers at camping supply store, but these cans will require a special adaptor for filling the engine's tank.) Simply press the nozzle of the butane canister hard onto the filler valve atop the tank, making sure that the gas valve is closed.\*\*\*



You will hear the gas transferring and will see a little gas bleed out of the valve. The gas may tend to sputter a little from time to time while filling. When the tank is full, the gas will begin to sputter a lot and much more gas will escape the valve. When the gas tank is full you are ready to fire up the engine.

**NOTE:** Because of the size of this locomotive and the fact that it has two burners, a very large gas tank has been provided, which takes a while to completely fill.

If you find that you are getting relatively short runs and there is still a lot of water left in the boiler, chances are that you didn't fill the gas tank all the way.

### **Firing up:**

The engine's burners reside at the back of the flues inside the boiler. Open the hinged smokebox door at the front of the engine and you'll be able to see both flues.

To light up, strike a match and hold it at the open smokebox door while simultaneously opening the gas valve in the tender very slowly until the gas ignites. You should hear the gas coming into the burner. Opening the valve too wide or too fast may blow out the flame or cause the fire to burn in the smokebox.

The fire should flash back into the back of the flues with a quiet "pop." If it wants to burn in the smokebox or in the forward part of the flues, 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 fire should burn in crescent-shaped flames that should be clearly visible through the smokebox door. The flames should be bright blue and should burn steadily. If they sputter or look yellow or green, adjust the gas valve accordingly.

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.

Make certain that both burners have ignited by looking down the flues at the fires. If only one burner is lit, simply strike another match and put the flame in the smokebox. This should ignite the second burner. If a burner goes out while the engine is in operation (you might be able to tell by the sound of the fire or by sluggish performance) it must be manually relit. One burner will not automatically ignite the other.



After ten or twelve minutes, pressure on the pressure gauge should read about 20 psi (pounds per square inch) or so. The safety valve is set at 60 psi. When the pressure on the gauge reaches 40 psi, the engine can be run.

### **Drain Cocks:**

This locomotive is fitted with working drain cocks on the cylinders. When first starting out, the cocks should be open (levers moved to the "outside" positions). This will allow water in the cylinders to drain while the cylinders heat up to working temperature.

As steam enters cold cylinders, it condenses, so expect a fair amount of water to come out at the beginning of each run. Once cylinders have warmed up, you can close drain cocks. To close them move the levers to the "up" position.

### **Running:**

Move the reversing lever at the right side of the cab to the forward position. With the engine on the track and without a train, open the throttle. The engine may need to be pushed a little to overcome the steam condensing into water in the cold cylinders, but open drain cocks will minimize this. After a few moments, the engine should take off on its own, moving away smoothly.

Once the engine is running smoothly, a train can be coupled on and the run can proceed.

Since all of the locomotive'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 though the run if you want to change speed or direction.

If you have suitable track, the engine can be left to run on its own at a steady speed. Keep your eye on the water glass. With practice and good weather, steady runs of an hour or more are not uncommon for this engine.

### **Axle Pump:**

This locomotive is equipped with an axle pump and bypass valve. The pump moves water from the tender to a check valve on the locomotive. The bypass valve is located on the back right side of the cab. When the bypass valve is completely shut, water is pumped into the locomotive. When the bypass valve is open, the pump will re-circulate water back into the tender.

