Instruction Manual
GS-4 Daylight Live Steam
Alcohol Fired

Southern Pacific GS-4 4-8-4 No. 4449

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ACCUCRAFT TRAINS
MUSEUM QUALITY BRASS MODELS

GS-4 Daylight Live Steam – Alcohol Fired

Prototype Information:

Californians who witnessed the early runs of the Southern Pacific red, orange and black consists declared them to be “the most beautiful trains in the world”. The striping on locomotive, tender, and the length of the train presented a bright, cheery image to a nation emerging from the Great Depression.

In 1941, Lima built 28 GS4-class 4-8-4s, and were numbered from 4430 -- 4457. No. 4449 was the only Daylight painted GS-class preserved after lying stationary for years in a park in Portland, Oregon, she was resurrected in red, white and blue livery in 1975 to pull the American Freedom Train around the U.S.A to commemorate the Bicentennial of American Independence. Since then, the 4449 has been meticulously maintained. Today, the 4449 is occasionally run on special trips.

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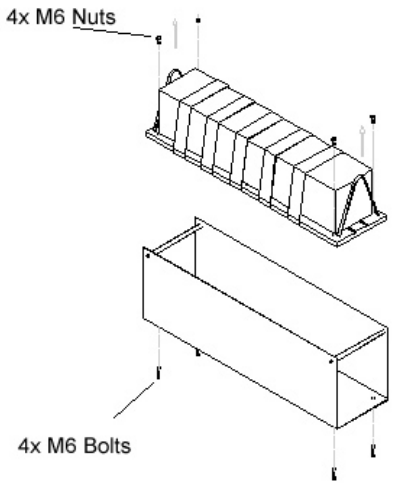
NOTES:

4. Place taped locomotive on a level 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. The tape cannot be re-used to re-pack the model. Use new packing tape if necessary.



General information About Accucraft GS-4 Daylight 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 GS4 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 GS-4 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 valves have been set at the factory to release at around 75 pounds per square inch of pressure. Never tamper with the safety valve

2. The firing system has been designed to use denatured alcohol. Do not use any 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. The Alcohol fire is nearly invisible so be absolutely sure that there is no flame burning around the engine when refueling is being done!

4. Start your electric blower fan first before lighting the fire. This will keep the fire in the firebox where it belongs and the alcohol vapors vented and minimize fumes that can be irritating to the eyes and sinuses.

5. A steam engine gets hot. Be Careful.

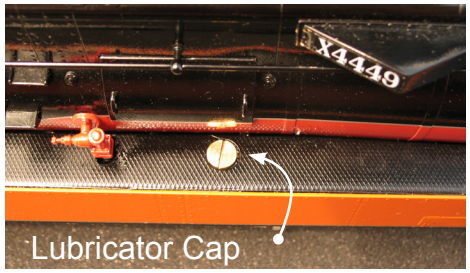
The locomotive and tender should always be carried separately because of their weight. We suggest carrying the locomotive to the track by supporting it underneath the wheels with both hands, as opposed to lifting by the pilot (which may not stand the stress) and rear beam.

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

Operation

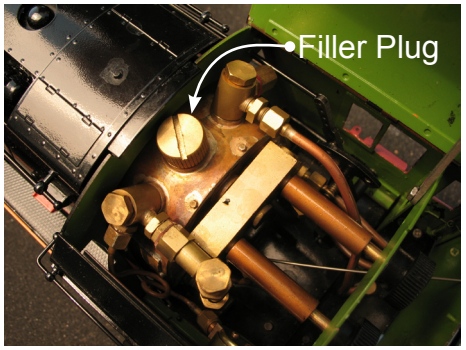
1. Oil all external moving parts of the engine and tender with high grade, lightweight machine oil like 3-in-1. Don't forget the wheel bearings in the pilot and trailing trucks as well as those in the tender. Don't over oil; a tiny drop will do the job.

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.



3. The displacement lubricator is disguised as an air tank under the left hand running board. This lubricator 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's cap and draw out any water from the previous run with a syringe. Fill the lubricator to the top with proper steam cylinder oil.



4. Unscrew the filler plug, which is at the top of the steam turret (atop of the boiler, inside the cab) and fill the boiler with water. The water level will show in the sight glass on the boilers back head. 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 over fill the boiler, there needs to be room above the water for steam to form.

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

5. Finally add fuel.
Your GS-4 burns denatured alcohol. The fuel tank is located in the tender beneath the oil bunker. Alcohol can be purchased at most home improvement stores.

The alcohol should be either Methyl alcohol or preferably Ethyl alcohol which will burn at a higher temperature, making the locomotive more efficient.

GS-4 Daylight Live Steam – Alcohol Fired

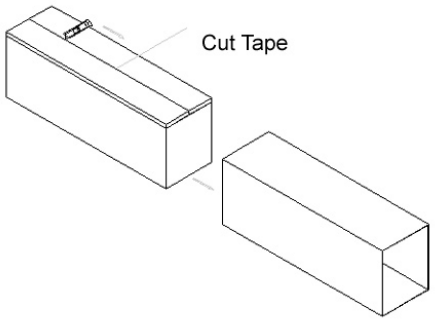
Accucraft locomotives are fine scale brass models with small parts. To provide maximum protection from shipping damage, we carefully pack the models in metal cases.

We ship via UPS with insurance coverage to its full value. Please contact UPS if package is damaged.

Each locomotive is packed under UPS guidelines for shipping. We do not warrant any damage resulted from re-packaging by any party other than Accucraft Trains.

Please read the following directions before unpacking your locomotive.

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



2. Lift the metal case from the cardboard box.

3. The locomotive is firmly taped to a ½" wood board which is then fastened to the metal case with 4 M6 bolts. The bolts must be removed before lifting the locomotive with wood board from the metal case.

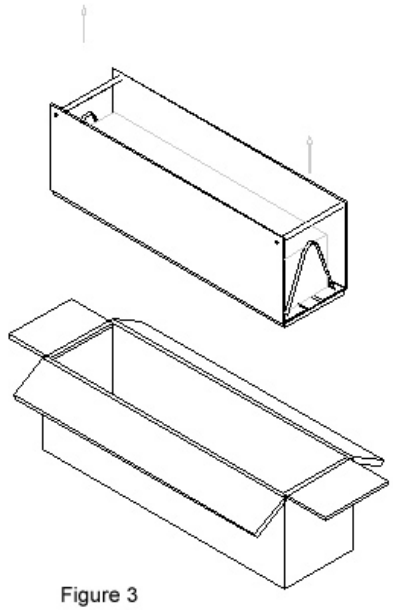


Figure 3

Shutting down:

To shut the engine down, simply close the valve and use your CO_2 tire inflator to extinguish the fire.

Make sure the fire is completely out before turning off the steam blower if engine is standing still. This will minimize the chance of the paint getting scorched from any fire still burning in the firebox that is not vented!

Use your CO_2 inflator to put out the fire! We can not stress this enough.

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 and prevent a vacuum from forming inside that could draw lubricating oil into the boiler if the throttle valve is not fully closed.

Because of the size of this 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.

Notes on Radio control:

Although the GS-4 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 lever. The gas valve should always be controlled manually.

The reversing lever will have to be modified so that it does not lock in position, but it must still have stops at either end of its throw for proper positioning of the reversing gear.

Technical Specifications:

Scale/Gauge: 1/32, 45 mm Gauge
Total Weight: 13.7 Kg, 30.1 lbs.
Engine Length: 658 mm, 25.9 ins.
Engine Width: 110 mm, 4.3 ins.
Engine Height: 162 mm, 6.4 ins.
Tender Length: 450 mm, 17.7 ins.
Tender Width: 108 mm, 4.3 ins.
Tender Height: 150 mm, 5.9 ins.
Driver Wheels: Dia.63 mm, 2.5 ins.
Recommended radius: 3 M, 10 ft

*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. AT ANY TIME, OPERATORS MUST NOT COME IN CONTACT WITH THE MODEL WHILE IT IS POWERED. UNDER NO CIRCUMSTANCES SHALL ACCUCRAFT TRAINS BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSENQENTIAL DAMAGES ARISING IN REGARD TO ANY ACUCRAFT PRODUCT.

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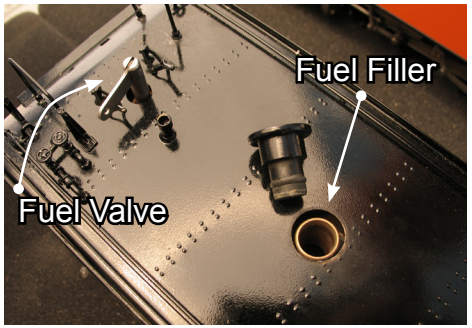
Use a small funnel to fill the fuel tank with alcohol. The tank is designed to meter the fuel into the burner. It should saturate the wick material without leaking out over the top of the burner causing a puddle of alcohol under the locomotive.

When fueling the locomotive the fuel valve should be shut. Replace filler cap as soon as possible after filling tank. The alcohol will cause the o-ring to dry out, use a small drop of machine oil on the o-ring to keep it pliable. When lighting and running the locomotive the valve should be open approximately one complete turn.

When shutting down the locomotive simply close the valve. It will take some time for the alcohol to burn out of the burner.

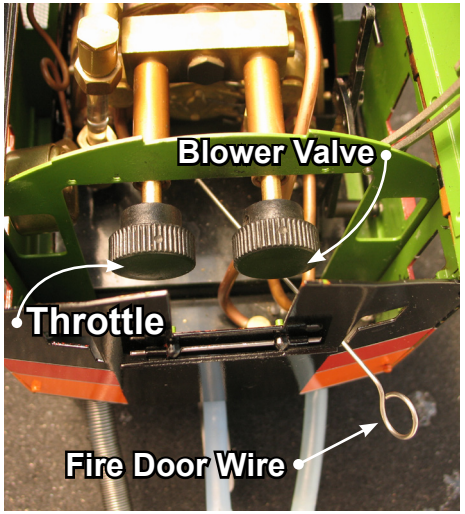
A better way of extinguishing the fire is to get a small CO_2 tire inflator and screw a bicycle valve stem to the end of the inflator. A quick blast down the stack after closing the valve and the fire is out.

The fire needs a draft to burn properly so be sure to have your electric blower fan on and running before you light your fire.



Firing Up:

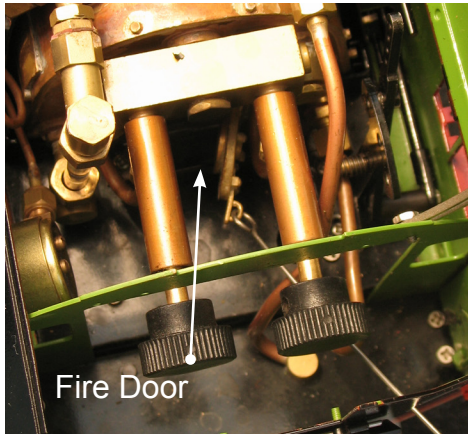
The engines burner is in the fire box of the locomotive. It can be lit through the fire door located on the engines back head. The door swings open by pulling the wire.



First open the fuel valve one full turn. Then wait until the burner wicks are saturated with fuel. Start your electric blower fan and light the burner with a fire stick. Make sure both sides of the burner are lit. this can clearly be seen by looking in the fire door.

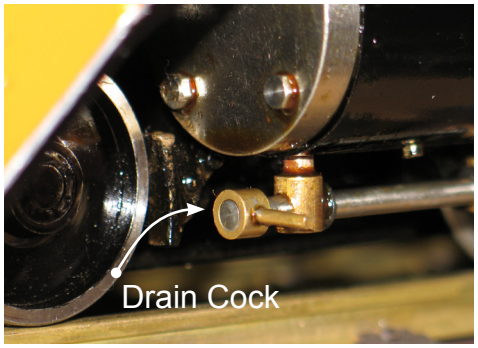
It will take approximately 10 minutes to raise pressure. Once the gauge reaches 20 lbs. you can shut off and remove the blower fan from the stack and then turn on the engines internal blower. At this point steam will rise rapidly!

Condensation that has formed in the blower line will run out the bottom of the locomotive, and then the dry steam will blast up the stack creating a draft pulling the hot gases forward through the flues. At this point the steam pressure will begin to rise rapidly. When the gauge reads 50 lbs. the engine is ready to run.



Drain Cocks:

Unlike most small scale, live steam locomotives, your GS-4 is fitted with working drain cocks on the cylinders. When first starting out, the cocks should be open (levers moved to "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 the cylinders have warmed up you can close the 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.

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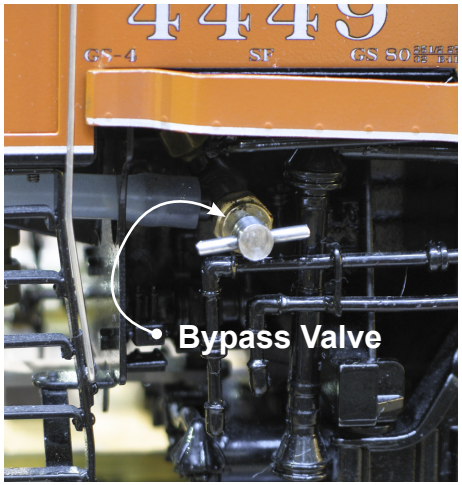
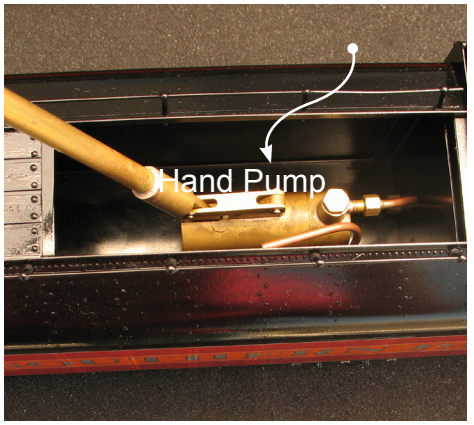
The engine may need to be pushed a little to overcome the steam condensing into water in the cold cylinders, but the open cocks will minimize this. After a few moments, the engine should take off on its own moving away smoothly.

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 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. Keep your eye on the water glass. When the water level reaches the bottom of the glass, shut the engine down and repeat the firing up process. With practice, 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 right side of the locomotive under the cab. When the bypass valve is completely shut, the pump pumps water into the locomotive. When the bypass valve is open, the pump will re-circulate water back into the tender.

With careful adjustment 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.