

FORNEY LIVE STEAM



INSTRUCTION MANUAL



ACCUCRAFT TRAINS
MUSEUM QUALITY BRASS MODELS



Thank you for purchasing Accucraft Trains Forney Live Steam Locomotive

Like other fine models from Accucraft Trains. The Forney has been designed to provide a lifetime of model railroading pleasure. The Forney is handcrafted in brass and is a precision piece of equipment. Like all fine equipment it must be properly maintained and cared for.

Notice

The information in this document is subject to change without notice.

The Forney



AC77-050 FORNEY 0-4-4



AC77-051 FORNEY 2-4-4

Features:

- Ready to Run
- All Brass Construction
- Piston-Type Slide Valves
- Fixed Eccentric
- Piston-Type Reversing Valve
- Water Level Gauge
- Pressure Gauge



General Information

The Forney is a freelance, 1:20.3 scale, live-steam locomotive based on Baldwin practice. It has been designed to be both simple to operate and sophisticated enough to satisfy more experienced modelers. With proper care, your Forney should give years of service in the garden.

Operating a live-steam locomotive is much different from running an electrical-powered engine. It is a more hands-on, interactive experience. The locomotive must be periodically fueled, oiled, and watered. As supplied, the Forney 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 Forney should pull two to four standard-size freight cars on good, level track, which is about the same capacity as a full-size locomotive of this configuration. 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.

Technical Specifications

Scale:	1:20.3
Gauge:	45mm
Wheel Arrangement:	0-4-4 & 2-4-4
Boiler:	Single Flue, Gas Fired, Silver-Soldered Copper, Tested To 150psi (working pressure, 30psi)
Boiler Fittings:	Safety Valve, Throttle, Plug For Add-On Pressure Gauge
Fuel:	Butane
Cylinder Lubrication:	Displacement Lubricator In The Cab
Cylinder:	Fixed Cylinders, Piston-type Side Valves, Exhaust Through The Stack
Valve Gear:	Fixed Eccentric Via Rocker Arms
Reversing Gear:	Piston-Type Reversing Valve Controlled From The Cab



Safety

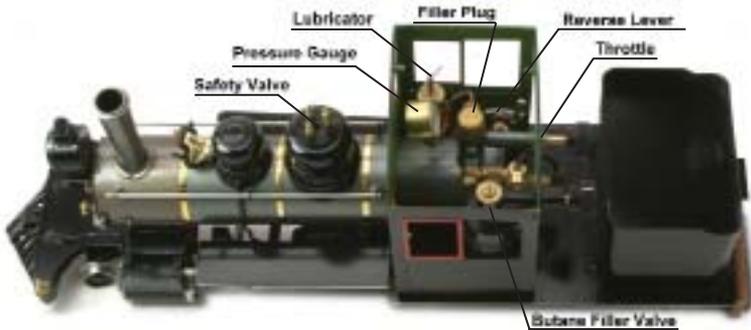
For your safety, there are certain rules that should be observed, as follows:

1. The safety valve has been set at the factory to release at 30 pounds per square inch of pressure. **Never tamper with the safety valve.**
2. The firing system has been designed to use butane gas only. Never use any other gas (including propane or butane/propane mix), 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 the match first, then turn on the gas.
5. A steam engine gets hot. Be careful. Lift the Forney by holding the end steps when hot.

Preparing the engine

A steam-locomotive engineer goes through a lighting-up ritual every time the engine is to be run. It is good to follow the same routine each time so that nothing is overlooked.

1. Oil all external moving parts of the engine with a high grade, lightweight machine oil like 3-in-1.
2. Remove the cab. Drain any water from the displacement lubricator in the cab and fill the lubricator to the top with proper steam cylinder oil. This lubricator makes sure the cylinders and valves are 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.
3. Fill the boiler (make sure the throttle is closed). A properly filled boiler will have 80ml of water in it. Do not fill the boiler full to the top. There must be room for the steam above the water level. If there is water in the boiler already and you don't know how much, fill the boiler to the top, then remove 30ml. Use only distilled water in your engine's boiler. Tap water contains minerals that will leach out and ultimately affect the performance of the engine.



4. Finally, add fuel. Butane gas can be purchased at the grocery store or at a tobacconist's as cigarette-lighter refills. These come with a nipple suitable for the filler valve on the Forney's gas tank. Butane can also be purchased in larger containers at camping-supply stores, but these cans will require a special adapter for filling. Simply press the nozzle of the butane canister hard onto the filler valve. You will hear the gas transferring and 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 and the cab has been replaced, you are ready to fire up the engine.

Firing up

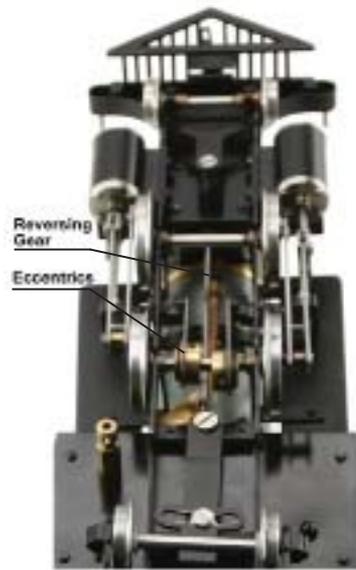
The Forney's burner resides at the back of the flue inside the boiler. Open the hinged smokebox door at the front of the engine and you'll be able to see the flue. To light up, strike a match and hold it at the open smokebox door while simultaneously opening the gas valve in the cab very slowly until the gas ignites. You should hear the gas coming into the burner. 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 flue with a quiet "pop." If it wants 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 maybe damaged. The flame should be bright blue and should burn steadily. 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

When the safety valve blows, you'll know that pressure is up to working level. This should take 5-8 minutes or so. The air temperature will have an effect on this. It will take longer on cold days and less on hot days. Butane gas turns to non-pressurized liquid at 32°F, so the engine may have difficulty on very cold days, unless it is fired up indoors.

Running

With the engine on the track, and without a train, open the throttle. Because the cylinders are cold, the hot steam entering them will condense into water and be exhausted out the stack. Hot water squirting out the stack at the start of a run is normal. The Forney will need to be pushed back and forth until the cylinders heat up. You may need to exert a little downward pressure on the engine to get the wheels to turn, which will overcome the resistance of the water in the cylinders. Be sure to put the engine into reverse, using the lever at the right side of the cab, when pushing it backwards. When the cylinders have warmed a little, the engine will begin to show signs of life. After a few moments, it 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 Forney's functions are controlled from the cab, it can be driven like a full-size loco, meaning that you'll have to stay with the engine throughout 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 warms, you may find the engine picking up speed. Simply 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.

A word on speed: Little engines like the Forney were rarely run at more than 5 or 10 mph. If you imagine a little person running alongside, that is about the right prototypical speed. When run at this slower speed, steam and fuel consumption are lower, which increases the run time.

The Forney 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 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 safety valve 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'll probably find that your engine has a coating of oil. 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 hot. Wipe any grit and excess oil from the wheels and running gear.

The boiler can be drained of water, or not, as you will. Leaving water 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 the Forney 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. Servos can be mounted to the floor of the loco and linked to the control arms. 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 valve. You might be able to get away with one servo controlling only the reversing valve, but better control of the locomotive will be accomplished if the throttle is controlled, too.

The receiver and battery pack can be fitted to the bunker behind the cab to house them.



Limited One-Year Warranty

Accucraft Trains warrants that the mechanical components of its model trains will be free of any defect or malfunction under normal use for one year of the original purchaser and will remedy any mechanical components which prove to be thus malfunction. This warranty does not extend to : (1.) any damage to the locomotive resulting from any improper or unreasonable use of the locomotive or from any use of the locomotive in any manner other than that for which it is intended, (2.) any damage to the finish or casting of the locomotive, or (3.) any other damage (except for damage resulting from a covered defect or malfunction) to the locomotive while in the possession of any consumer.

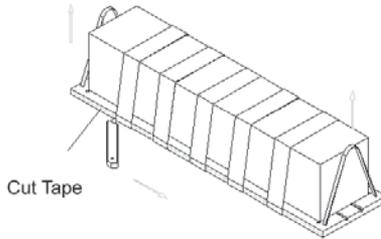
This warranty is given in lieu of all other express warranties. All implied warranties, including but not limited to the implied warranties of merchant ability and fitness for a particular purpose shall expire one year from date of original purchase. (Note: the foregoing limitation on implied warranties is proper under Magnuson-Moss Warranty Act.) UNDER NO CIRCUMSTANCES SHALL ACCUCRAFT TRAINS BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING IN REGARD TO ANY ACCUCRAFT PRODUCT.

In order to validate this warranty, the Owner Registration Card enclosed with your locomotive must be completed and mailed within ten (10) days after purchase of the model.

If warranty service is required after more than one year from the date of purchase, please request return authorization by phone or letter. Upon receipt of authorization, please send the locomotive, postage prepaid, with a check or money order for the amount of \$30.00 in U.S. currency, (price applies to U.S. only) to cover return postage and handling. Also please write a letter explaining the nature of your problem and enclose it with the locomotive.

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.



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