No. 164, November/December 2019 US $5.95
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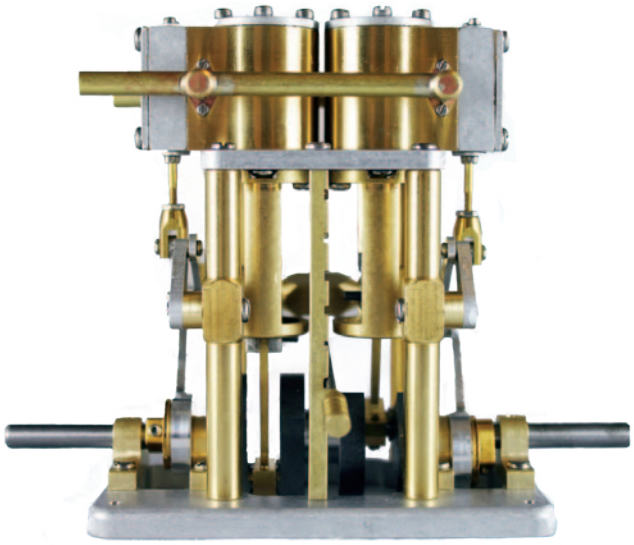
STEAM IN THE GARDEN

Accucraft Heisler Locomotive Review

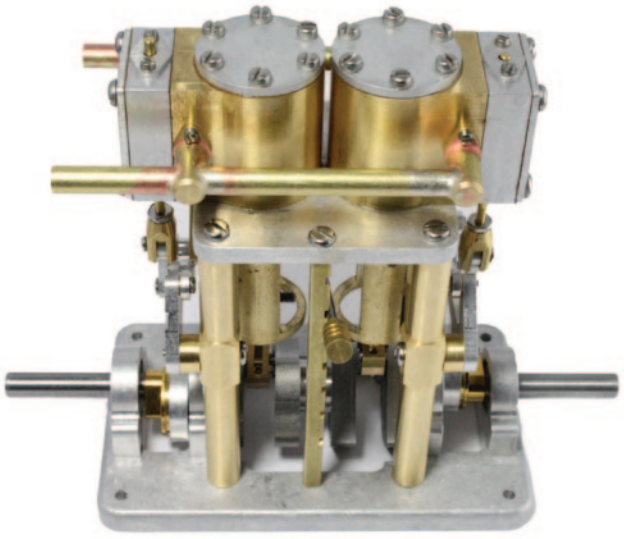
Freelance Heisler Project - Part 5,
Steam Boats, Weekend Project - Low Profile Safety Valve... and lots more!

Fully Machined Steam Engine Kits



TVR1A

Ready to assemble steam engine kit: $245
Fully Assembled and Tested: $350
Includes all hardware
Double acting, twin cylinder
Hackworth reversing gear
Includes full-color assembly manual
Dimensions:
Base: 3.000" x 1.844"
Crankshaft end-to-end: 4.344"
Height: 3.375"
Weight: 327 g



TVR1ABB

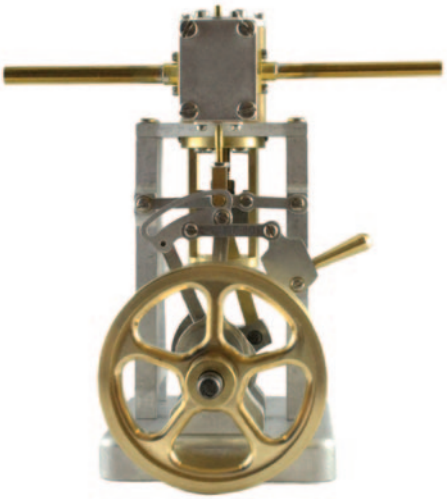
Ready to assemble steam engine kit: $295
Fully assembled and tested: $400
Includes all hardware
SAME AS TVR1A but with shielded ball bearings
Includes full-color assembly manual
Dimensions: Same as TVR1A
Weight: 323 g

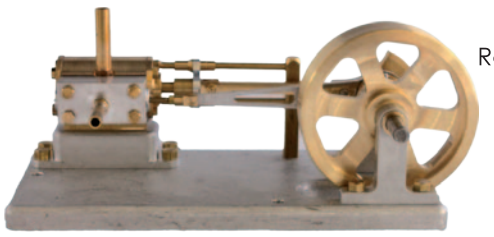
Flywheels for TVR1A / TVR1ABB

MFLY: $20
1 3/8" DIA
(Solid Marine)

BFLY1: $25
1 3/4" DIA (5 Spoke)

BFLY2: $30
1 3/4" DIA (6 Spoke)





HM1

Ready to assemble steam engine kit: $95
Fully Assembled and Tested: $145
Kit includes all hardware
.344" bore, .500" stroke
Double acting, single cylinder
Includes full-color assembly manual

VR1A

Ready to assemble steam engine kit: $119
Fully Assembled and Tested: $175
Includes all hardware
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Double acting, single cylinder
Reversing lever
Includes full-color assembly manual

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STEAM IN THE GARDEN

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into trains, propelled by fire ...

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http://www.steamup.com/

Cover: An Accucraft Heisler locomotive sits in the Southern California sun ready for a run. **Photo by Jeff Campbell**

Also inside:

LATEST WAYBILL

In Memoriams

Ruthy Saley

Ruth Sundin Saley passed away on May 30th, 2019.

She was Norm Saleys' wife for 65 years! That is a milestone few have achieved, and best described as a Union, not just a marriage.

Tough New England stock, the Saleys' moved to Central Florida in 1958.

Ruth and Norm have three children, Ed, Starr, and Norma. Ruth was able to stay home and take care of her children. There are eight grandchildren and 15 great-grandchildren! After child rearing, Ruth went to work as a bookkeeper for 30 years.

I first met Norm And Ruth Saley in 1996. The Florida Garden Railway Society hosted the National Garden Railway Convention that year in and around Orlando. I was "scouting" for garden railroad layouts for tours during the convention. The Saleys' were very welcoming. Norm pulled me aside to show me " something" . He produced two rather old live steam engines. Thus began our relationship.

For over twenty years, Ruth appeared with Norm at most every live steam event both in Florida and at National events. She always looked after Norm and he after her.

She was a kind and gentle soul, always with good things to say. To know her was to immediately like her.

I am joined by many who will miss seeing Ruth at Norm's side.

Respectfully,

Bill Chamberlain

Gary Watkins

Gary Edward Watkins was born in Oakland, CA on April 28, 1940 to Edward and Violet Watkins. He passed away peacefully at home, surrounded by family on June 9, 2019, at the age of 79.

Gary was an avid train enthusiast and owned *Sierra Valley Enterprises*, supplying custom-built trains throughout the United States and the world. Gary was a member of the Merced Corvette Club and was a SF Giants and 49ers fan.

Gary was preceded in death by his wife, Mary Frances Watkins.

Carol Hergert

Carol Ann Herget was born on April 15, 1940 in St. Louis, MO; she was the daughter of Arthur William Laird and Mary Queen Russell. She died on June 28, 2019 at St. Joe Manor in Bonne Terre, MO at the age of 79.

She is survived by her loving husband, Larry Edward Herget of De Soto, MO, married on May 31, 1957 in Manchester, MO; son, Edward William Herget of Hillsboro, MO; daughter, Janet Feutral of Washington, MO; sister, Mary "Tina" Miniea of Fort Myers, FL; brother, Arthur (Shirley) Laird of Cape Coral, FL; six grandchildren; and 10 great-grandchildren.

Carol and her husband Larry started *Ozark Miniatures,* supplying the small scale live steam community and large scale model railroading with cast metal detail parts. Their contribution to the hobby lives on today with finescale castings becoming a part of many a modellers projects.

Carol was a member of Mt. Olive Methodist Church; past Ladies Auxiliary President at the De Soto Elks Lodge 689; she loved to dance and participate in De Soto parades with her husband and their tractor.

Robert Claude "Bob" Starr

Rick Parker Photo

Bob Starr passed away last May 24th in a hospital in Chula Vista, California, following complications from pneumonia and a stroke. He had just passed his 72nd birthday.

A talented modeler and builder of small steamers, Bob was a major presence in the Southern California Steam Scene for decades. In the days when the Big Train Show was at the Queen Mary, Bob and his wife Jackie would bring their camper to the parking lot and set up a portable track, where he and others would demonstrate live steam to newbies. Belying a grizzled 'mountain man' appearance, Bob was a very down to earth and patient teacher of the craft. Bob and Jackie loved nature, and living in the mountains, even after getting burned out of their Cedarleaf home in 2003. Jackie passed in 2017, and that seemed to take some of the wind out of Bob's sails.

Bob probably introduced thousands of people to live steam. His gentle friendship is missed by many.

Sierra Valley Enterprises now a part of The Train Department, Hazlet, NJ-

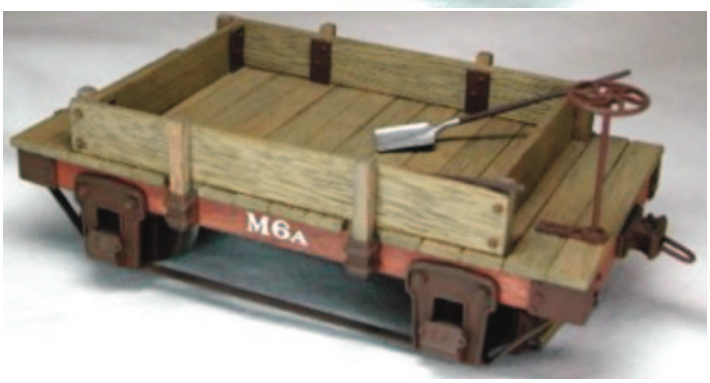
Jason Kovac, proprietor of TTD announced that his company is the new owner and supplier of Sierra Valley Enterprises for both model products and wheelsets.

The deal to take over part of the lineup of wheels, along with the intellectual property of the Munger Mining and 7/8ths kits, was started prior to Gary's passing and was recently completed with Gary's family. The Train Department will be receiving available inventory in August 2019.

The website domain of *www.sierravalleyenterprises.com* will be retained with a new web presence being created and updated. The updated site will link to *www.thetraindepartment.com* with reciprocal links as well.

The casting line of 7/8ths parts will be available soon as will be the 1/20.3 Munger Mining cars and 7/8ths cars in kit/RTR form. Planning is ongoing to reissue the Plymouth as a RTR model following re-engineering of parts no longer available.

One of the things Gary worked on and never released was a 7/8ths 2-truck short boxcar. The prototype was done but never went into production. Jason is planning to engineer a kit from the prototype and issue that in time to honor Gary and his contributions to the hobby.



Pennsylvania R.R. Milk Car

Bob Clark, of Stoke'm & Smoke'm announces that the Milk Car Reefer is now in final development. This has been developed in response to the request from Pennsy G-5 locomotive owners. Along with their new Combine car, folks can now have a milk train that the Pennsy operated thru the early 1950's! Kits come with trucks, metal wheels, Kadee couplers, and many more details. This kit has a custom roof specific to this class of car. Contact Bob @ 301-467-3348 for details and ordering!

Accucraft Heisler

Text & Photos by Jeff Campbell

Specifications

Scale / Gauge.	1:20.3 / 45 mm
Construction.	Brass & Stainless Steel
Mini. Radius.	4 ft.
Length.	19 in. (482.6 mm)
Width.	5.8 in. (147.32 mm)
Height.	7.25 in. (184.15mm)

Features:

- Butane fired
- Safety valve
- Pressure gauge
- Water level gauge
- Lubricator
- Hand water pump

Introduction

Accucraft Trains of Union City California has a reputation of doing their homework when it comes to accurately replicating a particular piece of railroad equipment. While engineering the last of the three great western geared steam locomotives (the Shay and Climax came first), Accucraft again demonstrated with their Heisler their ability to produce a good looking and hard pulling representation of the prototype.

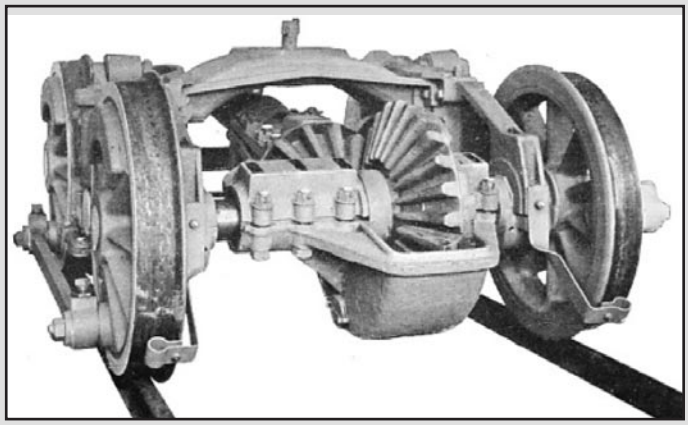
I have always enjoyed the geared locomotives. The idea of one of these clattering beasts negotiating the tight turns and steep hills of a forest while the crew desperately tries to maintain some sense of order in the cab appeals to my idea of mechanical and historical fun. It also helps that my personal garden railroad employs some relatively "prototypical" turns and hills that make running geared live steam locomotives much more practical. I became interested in the Westside Lumber Co. after finding the delightfully small No.6 Westside caboose on the internet in Hartford Products kit form. It was great fun to assemble and detail, but then I needed something to pull it with, right? Justifying a new locomotive has rarely been difficult and the Heisler's appearance and power fit the bill perfectly for my layout.

The model comes in a sturdy wooden box and is packed quite well. Lifting it out of its box requires some muscle, and reveals a stocky but well-proportioned 1:20.3 scale engine. It is 19 inches long, seven and one-half inches high, and five and three-quarter inches wide, so making sure of track clearances prior to the first run is a good idea. (Ask me how I learned about this.) Its wagon top boiler and diamond shaped split frame (see **Photo 1**) make it stand out next to other geared engines, but the most intriguing item are those cylinders. Those huge hunks of brass sticking straight up at you from beneath the boiler demand your attention and convey a strong sense of power. This model is a brute. It is also executed brilliantly. The engine's

Brief History of Heislers

Of the three geared locos, the Heisler has the smallest manufacturing numbers at only 625 units produced between the 1890s and the start of WWII. This may be due to the fact that the Heislers didn't start production until ten years after the Shay and Climax, which by that time had effectively flooded the market. When ordering a new locomotive, struggling railroads had many things to consider in order to pick the right engine. Pulling power and fuel consumption were often the first considerations, along with turning radii and hill climbing ability. Heislers were competitive in all of these areas but were known for being considerably quicker than the other geared locos, and statistically spent less time in the shop. They had fewer parts and therefore had fewer things to break – an important fact when looking at a steep pike running up the side of a canyon miles from help.

While the other geared locomotives had their cylinders parallel to the side of the loco, the Heislers were set up vertically in a V-twin arrangement meeting at the crankshaft under the boiler at a 45-degree angle, not unlike a popular motorcycle engine. This produced a relatively smooth ride and ease of maintenance that appealed to crews and railroad owners. The crankshaft is connected to a drive line with five u-joints that turn a ring and pinion gear on the furthest forward and aft axles of the loco.



This ring and pinion is what gives the Heisler its two-to-one gear ratio and subsequent pulling power. The other two innermost axles are powered by the engine's distinctive side rods.

The WSL #3 was built in 1899 as a three-foot gauge, 74,000lbs locomotive that had a 160psi boiler pressure and 14,000lbs of tractive effort. In 1947 it was converted to standard gauge so it could work as the saw mill switcher (all that was needed for this transformation were longer axles) and did so until the end of operations in 1962. It was then purchased by the Roaring Camp & Big Trees R. R. in Felton California for $7000, converted back to narrow gauge, and currently makes tourist runs in the beautiful Santa Cruz mountains. Doesn't it feel good to know that this magnificent engine is still in service?

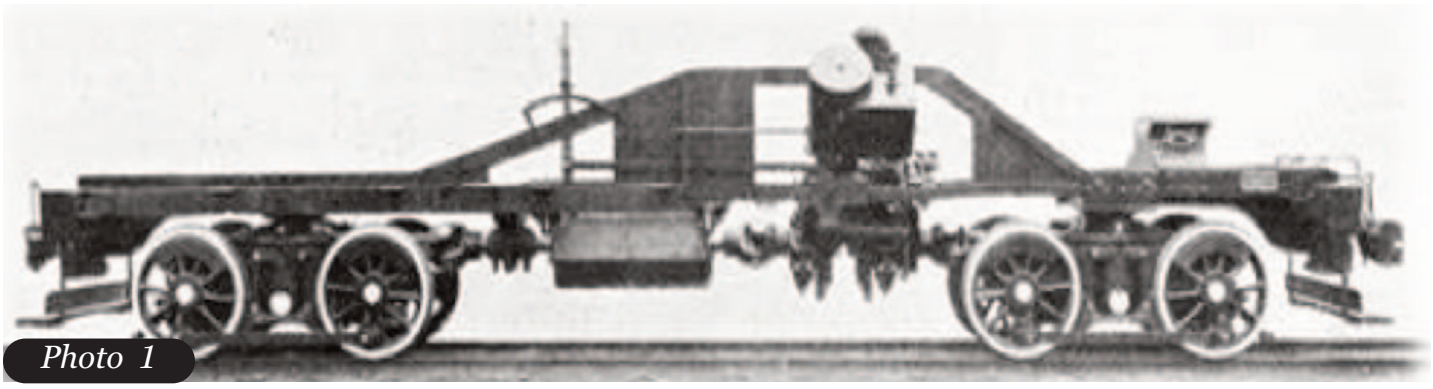


Photo 1

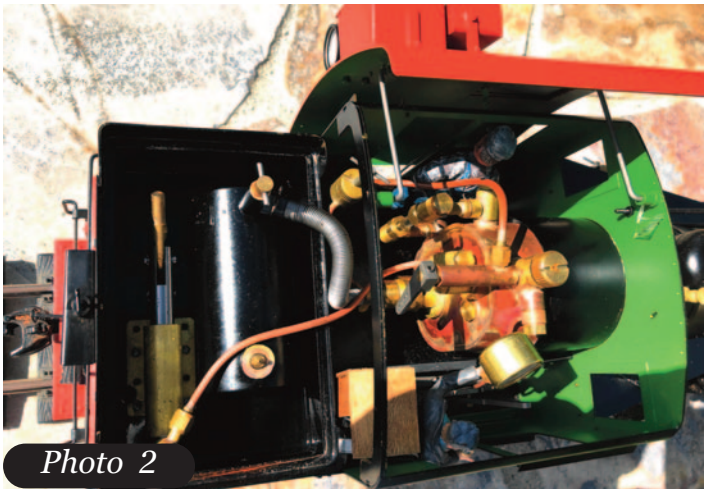


Photo 2

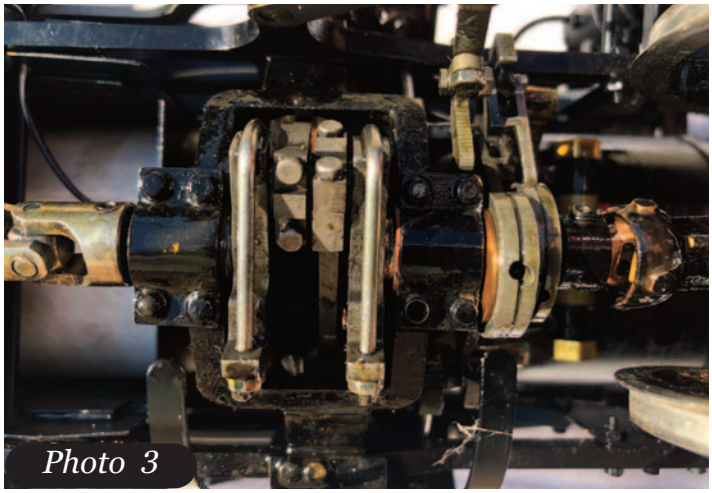


Photo 3

detail and craftsmanship are exceptional with its authentic outline, detailed pumps, real brass bell, flawless paint, and tool boxes on the roof just like the original. It all just seems to look right.

The cab roof hinges away to the left to access the back head controls that include a steam regulator, sight glass, pressure gauge, lubricator with a drain beneath the floor, water fill cap, and Johnson bar (**Photo 2**).

Operational cylinder cocks are also installed and although they aren't truly necessary, they add a great deal of steamy enjoyment to the startup process. There is lots of room in this cab. Lots! This and the servo arm type of control knob on the regulator make this engine a prime candidate for remote control. The regulator can also be reached with the roof down through the rear window without difficulty.

The butane fuel tank with its regulator and hand water pump are under the oil bunker at the rear of the engine, and herein lies the only fiddly part of the locomotive. Due to the tight tolerances of the bunker cover, it is not easily removable or replaceable. Certainly not to be tried while the engine is moving. Therefore making burner adjustments requires stopping the loco, removing the cover, adjusting the gas, replacing the cover, and steaming off. No huge deal, but a task just the same. The bunker is set up to be used as a water bath for the fuel tank as well as a source of boiler water. It's advantageous to have some water in the tender during the shutdown process so that the vacuum of the cooling boiler pulls in water for your next run.

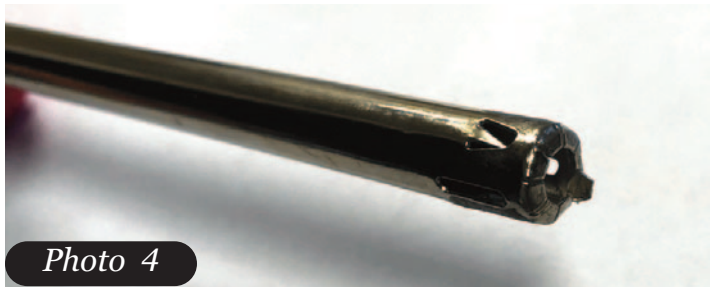


Photo 4

Operation

Time to boil some water!

The first run was done on a 65-degree Southern California day in February (with apologies to the snow-bound). The mechanical oiling of this engine takes some care since everything you need to oil — the crankshaft, Stephenson valve gear with its eccentrics, U-Joints, and axles — are all under the boiler, and the engine must be inverted to get to them. It's worth doing though, not just for the obvious value of lubricating the moving parts, but just to get a look at all of that delightful hardware. An abundance of shiny stainless steel and brass parts spinning around themselves in perfect coordination. Yum. The crankshaft counterweight itself is the size of a half dollar and is held by two huge bolts, just like the prototype (**Photo 3**).

Can you tell that I love this engine? After putting it on the track, filling the steam lubricator, water, and fuel are all typical and uncomplicated. Lighting is done by placing the lit igniter near the open smoke box door then slowly opening the gas regulator until the flame shoots back to the burner with a pop. All good. (I have a little trick I would like to impart to you about flame igniters. If you bend out one of the little flanges on the tip of the igniter, it can be used to pry open the firebox door. Particularly useful when the engine is hot – see

Photo 4.)

Anyway, it takes only a few minutes for the loco to start coming alive with the typical hissing and gurgling. After ten minutes it has reached 40psi and is very willing to run, although the pop off valve is set at 60psi. The cylinder cocks are opened (parallel to the engine is open, perpendicular is closed), Johnson bar pushed forward, and the throttle cracked. After rocking the engine back and forth twice with the Johnson bar, the engine finds its legs and easily glides off. While open, the cylinder cocks send plumes of steam in all directions, even on a warm day (**Photo 5**).

After one circuit, the cocks are closed, the fuel regulator is reduced, and a consist of five logging cars is attached. With the cocks closed there are fewer steam effects, but the engine has much more power and pulls away so effortlessly that it could have easily taken on three times the load and been happy as it chuffed around the track. Being geared at two-to-one, it has the typical machine gun sounding chuff of most geared engines and it is quite audible anywhere on the track. I was concerned that I wouldn't be able to see all that interesting drive-line action that one gets with the Shay, but the crankshaft with its huge counter balance and eccentrics are clearly visible spinning wildly under the boiler (**Photo 6**).

I like running a logging train at a low and slow throttle so occasionally the train would stop at a high point of the track. Despite being a geared locomotive, after a moment, it was able to self-start and continue without an issue, something I truly enjoy. It is happy doing this in forward or reverse.

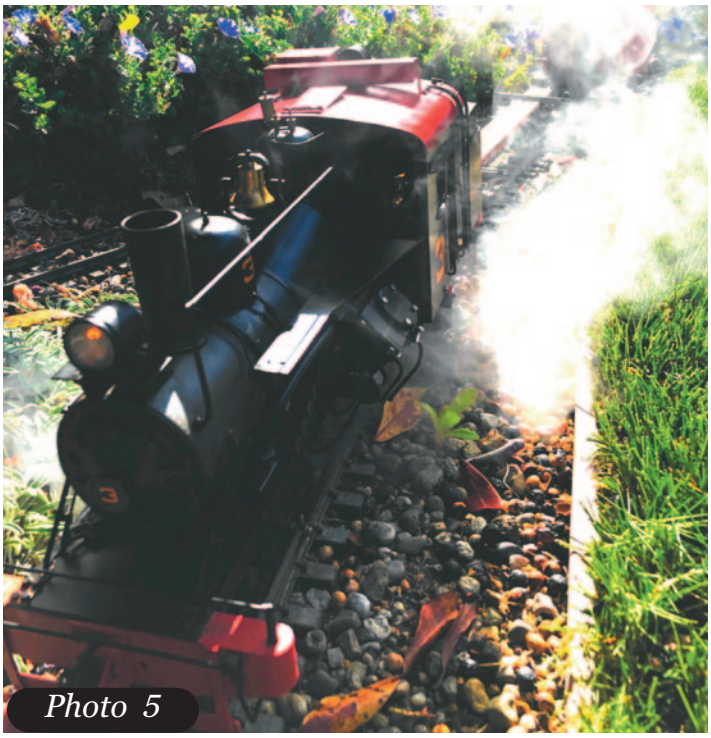


Photo 5

Photo 6

Some Modifications

Never being able to leave well enough alone, I have made a couple of modifications to the Heisler that add to its appearance. First, I think, a true logging locomotive needs to be weathered so it looks like it's working in a forest and not sitting in a box. Being terrified of commitment, I chose to use removable chalks on the Heisler to give it a loved but hard working griminess. After running an engine a few times, the oil that naturally accumulates on the surface holds the chalk "good nuf," and it is still relatively easy to wash off if necessary with WD-40 and water. In fact, in a flurry of disorganization, the closing photo for this article was taken after the chalk had been applied once and then washed off.

My steaming friends who like to give me a hard time about how run down my engines look will be glad to know that a new coat of weathering has been reapplied, (see Lead-in Photo). I purchased a pack of rust-colored chalk at a model railroad convention years ago and there are currently a number of retailers providing it on the "Interweb." However, if you are looking for just the right gray color to represent ash on the smokebox, try ash from your charcoal barbeque. It's cheap, abundant, and looks like, well, ash.

I also installed an operational headlight on the Heisler (see **Photo 7**). I found some nine- volt bulbs at Radio Shack that have a yellow hue which looks about right. Whatever looks right to you is what looks right.

Photo 7

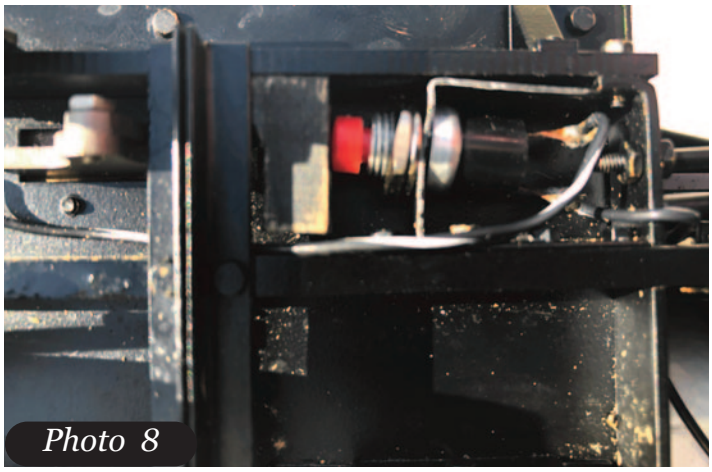


Photo 8

There is an existing small hole in the bottom of the headlight that just needs to be slightly enlarged in order to slide the wires through. Wanting to make the installation as unobtrusive as possible, I grounded one wire to a bolt that holds on the headlight and connected the battery pack to a frame bolt near the batteries' location. The brass chassis provides all the conductivity necessary to ground the power from one end to the other. This makes it possible to run only one wire down the smokebox, under the running board, and to the battery that's hidden in a wooden locker within the cab. Use Teflon-coated wires for this job or your installation will be short lived.

Again, not being able to leave well enough alone, I mounted a micro switch under the cab that is actuated by the Johnson bar (**Photo 8**). Once the loco is in steam, pushing the Johnson bar forward puts the Heisler in gear and turns on the headlight simultaneously. It took a little doing to fabricate and fit the small block of wood between the Johnson bar and the switch, but that's part of the steamy fun. Easy.

Conclusion

Now that I have become familiar with the Heisler I am able to get runs of up to forty minutes while pulling five cars, without adding fuel or water. It really takes care of itself so the owner can sit back and enjoy the run. I would highly recommend the Accucraft Heisler for someone who is interested in a narrow gauge geared locomotive. It is dependable, simple to run, and looks very much the part of its prototype. Oh, and, it's a brute.

Author's Heisler in its original as acquired state.

DIAMONDHEAD

◆ International Small Scale Steamup ◆

JANUARY 19 to 25 2020

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Workshop Project

Streamline Perfection

Text & Construction Photos by Bill Allen

John Wilkes Series
This five-part series includes:

- Part 1 - Chassis, Boiler, Ceramic Burner
- Part 2 - Boiler Wrapper, Nose Cone, Streamline Fairing
- Part 3 - Component Parts, Cab, Finishing Details
- Part 4 - Tender, Passenger Cars
- ➲ Part 5 - Interior & Paint

INTERIOR AND PAINT

One of the most interesting parts of this build is the car interiors. The Lehigh Valley passenger book showed exact layouts of every car with photographs of most of the interiors. These layouts were followed exactly and the colors were matched whenever there were photos to go by.

The upgraded seating areas had upholstered low-back round swiveling chairs. From the drawings and photographs, I was able to determine the size and shape. I then carved a master out of hardwood (**Photo 5-1**). Molds were made for the chairs and other features and urethane parts were cast (**Photo 5-2**). The coach benches were cut from hardwood (**Photo 5-3**). **Photo 5-4** shows the bits and pieces that will be scattered throughout the cars. Interior walls were made by ripping poplar wood on the band saw (**Photo 5-5**). Interior door

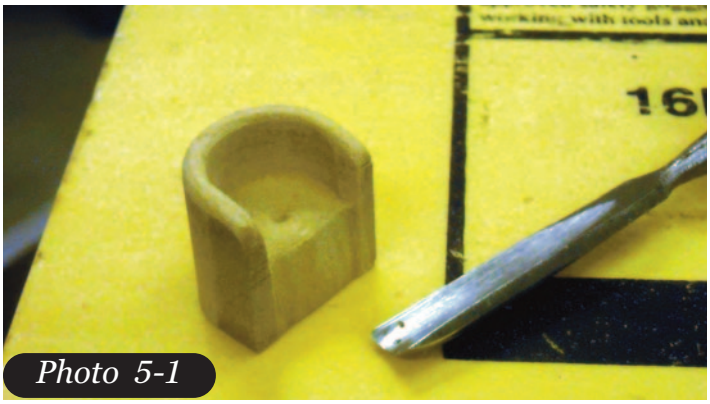


Photo 5-1

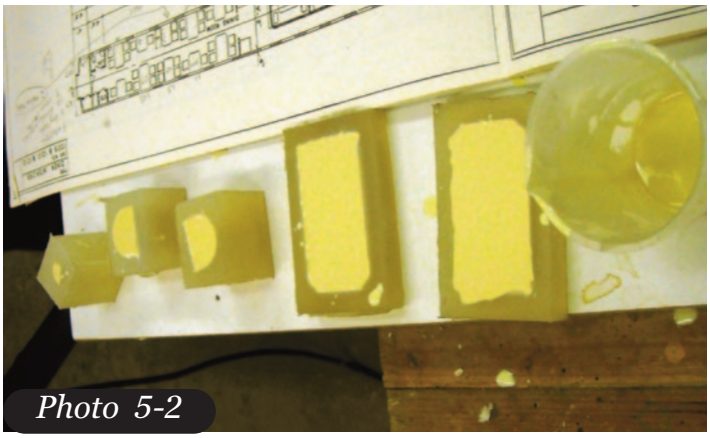


Photo 5-2

frames are laser cut from card stock and painted (**Photo 5-6**).

The car sides receive a base coat of black and then are masked off and the red strips are painted. They then receive a coat of two part urethane clear and the white pin stripes (**Photo 5-7**). A polycarbonate glazing strip is glued to the interior of the sides and window frames are glued to the glazing (**Photo 5-8**).

Building the Lehigh Valley John Wilkes Part Five

Rick Parker Photo

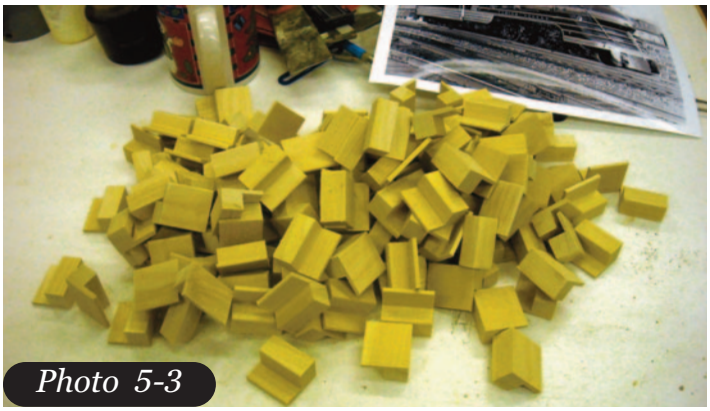


Photo 5-3

Photo 5-4

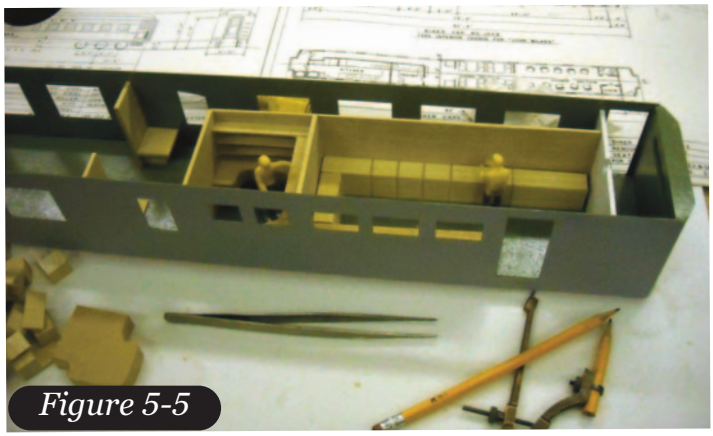


Figure 5-5

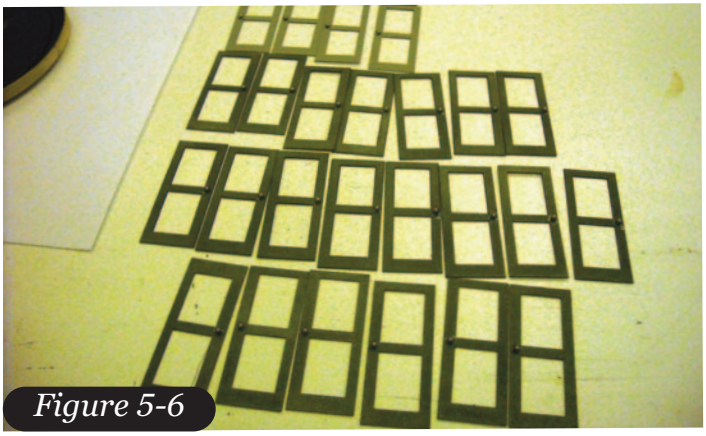


Figure 5-6

Photo 5-7

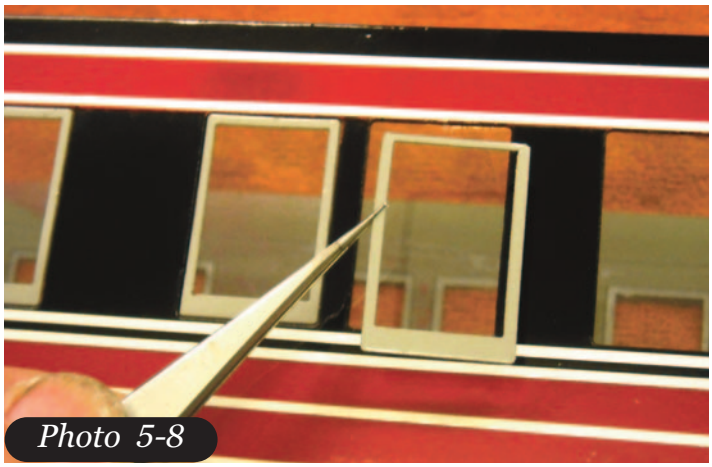


Photo 5-8

Photo 5-9

Photo 5-10

Photo 5-11

Photo 5-12

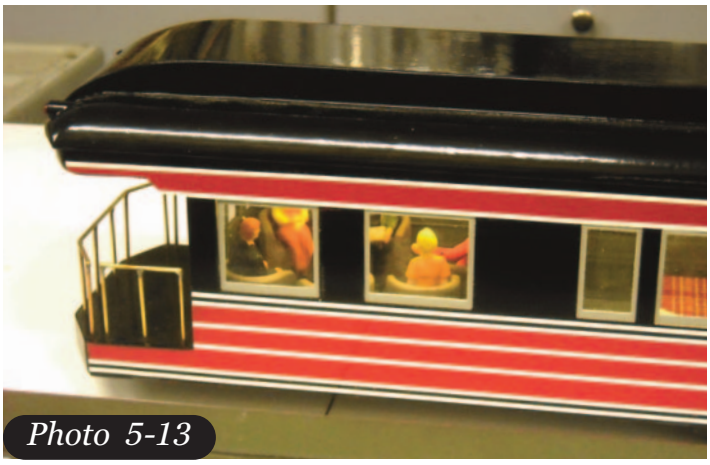


Photo 5-13

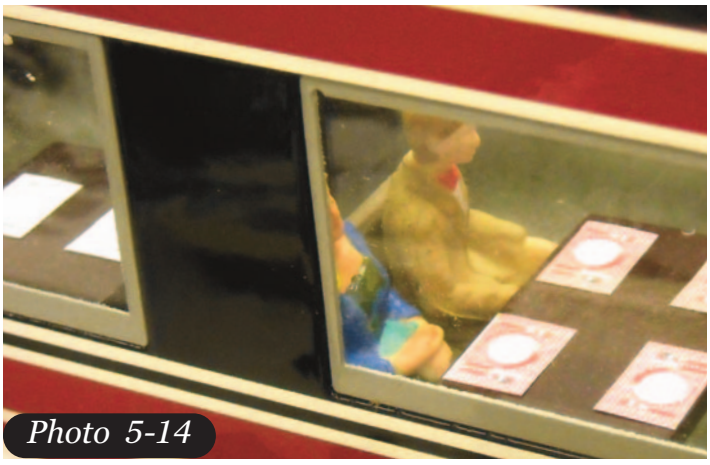


Photo 5-14

Photo 5-15

Photo 5-16


Photo 5-17


Photo 5-18


Photo 5-19

Photo 5-20


Photo 5-21

Kitchen workers are shown in **Photos 5-9** through **5-10** while **Photo 5-11** shows the conference/dinner table in the observation car and **Photo 5-12** and **Photo 5-13** show the observation room.

I try to add small details to the interior which can't always be seen while the train is in motion but does add to the interest while steaming up. The period LOOK magazine on the end table, the place mats on the dining table (**Photo 5-14**), and the man reading the period NEW YORK TIMES newspaper (**Photo 5-15**) are examples of this.

One of the nice things about this project is that other than the four coaches, every car was distinctively different. **Photos 5-16** to **5-19** show a variety of the interiors.

The diaphragms were made from a cast door and frame and a two piece striker plate with a 5/8-inch ribbon glued between both of them (**Photos 5-20** & **5-21**).

And finally...*THE END* (**Photo 5-22**).


Photo 5-22

A Piece of Folk Art Becomes a Steamer

Text & Photos by Joe Rothwell

This Three Part Series will cover the conversion and restoration of a historic piece of Folk Art and its transformation into a live steam powered model.

Part 1 - History, Survey, Gutting
Part 2 - Steam plant and boiler Install
➲ Part 3 - Details, Hull refinish, and first steam

The temptation is to go overboard and completely re-finish our tinplate cruiser. The boat is 1/200 scale, which is a popular scale for model boats. There are now lots of aftermarket fittings in this scale that makes it even more tempting to go nuts, including 3-D printed WWII German sailors and officers in various poses to populate the deck and guns! And the vessel being a piece of folk-art also green-lights the upgrade since it's not as collectable as a manufactured toy ship. However, on this project, too much detail may overwhelm it, so it might be better to stay with the original look of the ship. The patina is complimentary and it would be a shame if that was erased, so painting will be minimal with the hull bottom getting the most paint. From the beginning, this model was meant to sail as a toy boat, not be a scale model ship sitting on a mantel or shelf, so that's what I'm aiming for.

The German Navy carried a variety of motor-launches on their warships, with no two alike; and the degree of fit and finish on these vessels would rival any private yacht of the time. One surviving motor-launch was still attached to the model's deck, so this was removed and used as a pattern to make a few more, each a little different (**Photo 3-1**). They were carved out of balsa block material and the decks were skinned with very thin cedar veneer. Blocks of cedar were then sanded to shape and used for the cabin tops, and brass wire formed the handrails. A little bit of grey and black paint for the hulls and they were finished and set aside for re-attachment later (**Photo 3-2**). No life boats were on the model, so a set was made, along with some simple brass wire davits.

A brass tube was used to replace the missing mast. I used styrene for the crow's nest and other details, going by pictures and drawings found on the net (**Photos 3-3 & 3-4**). This ship was built before radar was used, so the crow's nest is rather large, being completely armored and as high as they could get it. Here, I saved weight by using plastic, and CA glue holds everything to the brass mast tube. Grey spray paint that was somewhat close in shade was used for anything that needed painting, including the new mast.

The bow was dressed up with some chains and anchors **(Photo 3-5**). The winches are a couple of servo screws with extra wide flanges – the wider top has the look of a capstan/winch. A stern anchor and chain was added like the full-size ship. All the

WWII "Tin Can"

Part 3


Photo 3-1


Photo 3-2

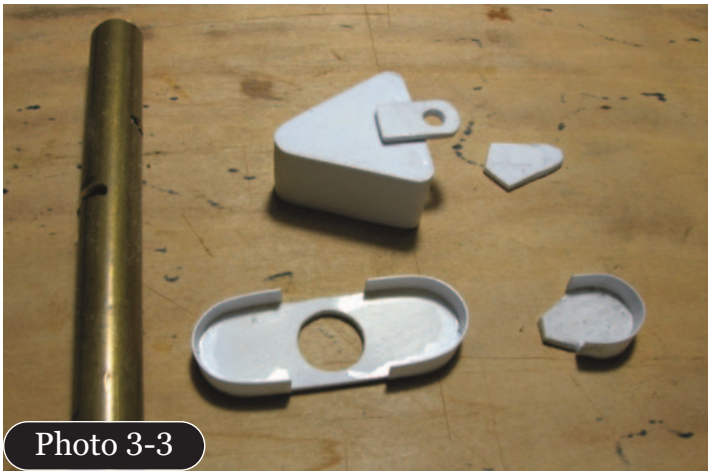


Photo 3-3

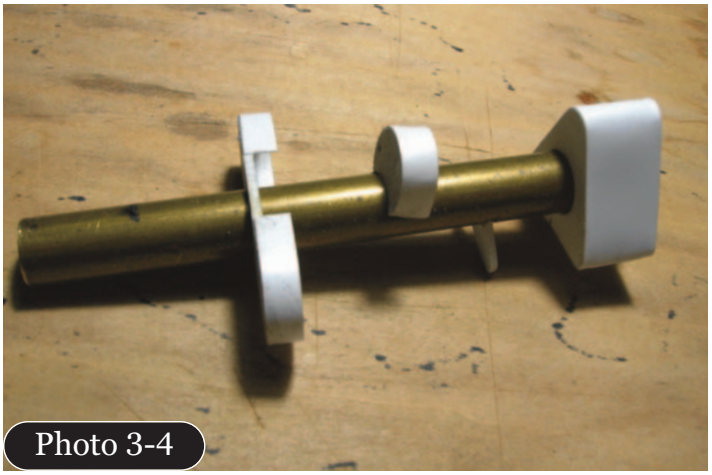


Photo 3-4

details are minimal in weight, but things can add up quickly if you're careless with the material used.

A dark rust-red bottom with a flat black waterline stripe was sprayed on with rattle cans. Careful taping with green 'frog' tape (low tack) was used, as the original paint will come off too easy when regular tape is pulled. The hull is missing quite a lot of paint and the temptation is to spray the whole hull. Instead, adding the portholes helped tie the old together with the new. The portholes are applied with a black permanent marker and a stencil (**Photo 3-6)**.

It's a bit of a tightrope when the model is some-


Photo 3-5


Photo 3-6

where between a scale model and a toy boat. To help keep it more on the toy side, the "TLAR" method was the main way things were made and applied throughout the restoration. TLAR equals "That Looks About Right". However, a plan view of the Leipzig which I found on the net kept things in check.

The finished boat surpassed my expectations. I'm very pleased with the final results and I hope the original builder would agree.

The boiler and burner are going to be the first upgrade the boat gets sometime in the future. These kind of projects are rarely 'finished', going through improvements over time. Total expenditures amount to $475 or so, but finding time to work on the project was the hardest part. Do bathtub Admirals wear epaulets?. I hope so, because I spotted a set on eBay, cheap...

With the final details added and a new paint job on the hull, the Leipzig is ready to hit the water under full steam.

The Price of Their Toys?

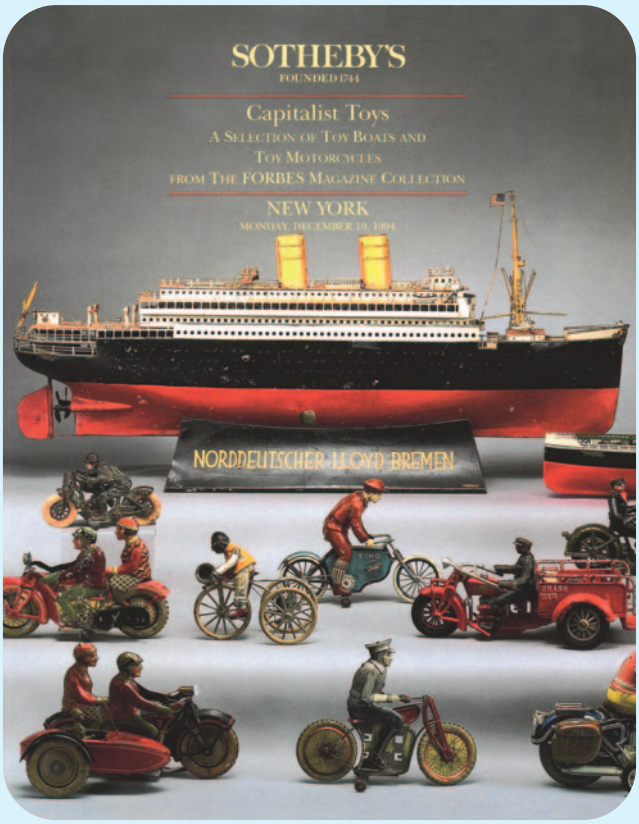
When trains and ships were the two options for long distance travel, it was reflected in the types of toys that children favored. With the arrival of jet planes, rocket ships and interstate highways in the 1940's-50's, toy train sets fell out of favor with kids and the once premier pastime took a back seat. Tin boat and ship toys fared even worse, being unceremoniously tossed into the trunk! For many years, these floating jewels were the underdog of collectible antique toys until the early 1970's, when a father and son reconnected over collecting these neglected gems. Malcom Forbes and his son, Robert, teamed up and ran ads in their magazine and in various publications around the world, seeking toy ships in any condition.

Obviously, money was no object and they went to antique shops and auctions, and through dusty attics across the globe, the thrill of the chase and the acquisition of the prize fueling the crusade. They amassed a fleet of over 500 toy ships over the next few years, and for about 20 years displayed the collection for free at their Forbes Galleries building on 5th Avenue in New York City. Parts of the collection would also go on world tours, being exhibited in museums and elsewhere.

The Forbes paid $20,000 to $30,000 for prime examples, setting record prices in the 70's and 80's and astonishing the public – a tin toy ship? In 1994, a small portion of the collection was handed over to Sotheby's auction house, and then again in 2010, the rest of the fleet was sent over and auctioned off at many times over their original investment. Live steam versions always commanded top dollar.

Proceeds were in excess of $2.3 million, which also included lead toy soldiers, game boards, tin motorcycles and toy-related art. However, the cost of displaying the fleet all those years had to be much higher, so it was the lucky public who benefited from the display and from the efforts of these two men and staff. The 5th Avenue building was sold in 2014.

Toy ship prices have dropped considerably since the auctions, but the large prime examples are still out of practical reach and have gone up. They hold the record for the highest amount paid for a mass-produced tin toy – tin ships went from lowly pauper to undisputed king. An early 1900's, 39-inch Marklin-made ocean liner was recently found in the attic of a Mid-West home and was sold to a European bidder at Bertoia Auctions in 2016 for over $270,000. This would have cost around $50 to $60 in 1910, which is two or three weeks gross pay for an average worker back then.



A FREELANCE HEISLER YOU CAN BUILD "FROM THE GROUND UP"

Part Five

Text, Drawings and Photos by
Les Knoll, P.E.

Freelance Heisler Construction Series

- Part 1 - Intro, trucks
- Part 1 Addendum - Machine-free trucks
- Part 2 - Building the frame
- Part 3 - Assembling, modifying and mounting the PM Research engine
- Part 4 - Smokebox
- ➲ Part 5 - Plumbing, Boiler modifications and steam testing
- Part 6 - Cab and bunker, misc details and wrap-up

Plumbing

Engine Piping

With the smokebox built, the engine piping can be installed. The exhaust piping mates up with the smokebox and the final run of exhaust piping is cut to fit the stack length, so the smokebox had to come first. There are three types of piping on this locomotive; the engine piping, both inlet and exhaust, done with PM research threaded nipples and fittings, the boiler piping from throttle to lubricator using tube fittings, and the gas line from gas tank to burner which also uses tube fittings.

The engine piping is done first (**Photo 5-1**). There are two lines to be run; the steam inlet and the exhaust. Make sure your engine is mounted in the mainframe before proceeding. Plumbing Details PL-1 and PL-2 shows the inlet and exhaust piping against a phantom illustration of the engine and mainframe (**Drawings 5-1 and 5-2**). It is important that the inlet piping be absolutely steam tight. As in larger scale plumbing applications, a pipe dope or sealant is essential. Pipe sealant is available from PM Research and the sealant sold in hardware stores for larger piping works OK, too. Make sure the sealant is fresh. The fittings on the steam lines should be tightened well, but not to the point of breaking! Start with the street ell PL-1 in the engine base and work back from there (**Photos 5-2 and 5-3**). The final fitting in this installation, the union PL-3, will connect directly to the output of the Roundhouse lubricator. The lubricator tubing will be bent to fit when the boiler is installed (**Photo 5-4**).

The exhaust piping is not as critical leak-wise as the steam pressure piping. I did not use any sealant

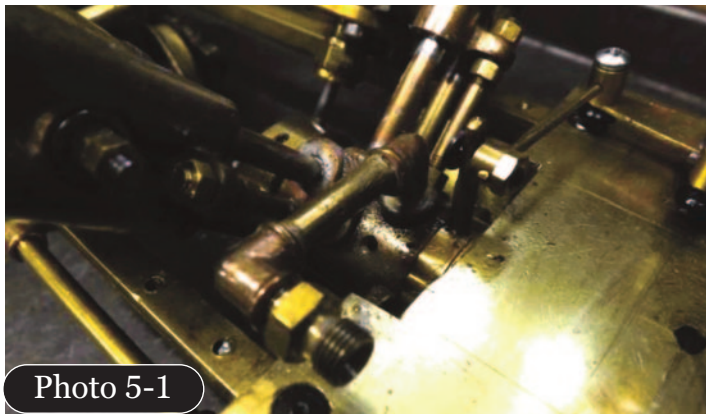


Photo 5-1

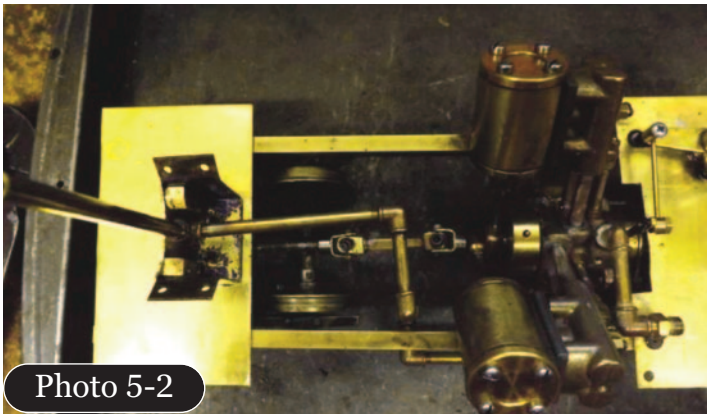


Photo 5-2

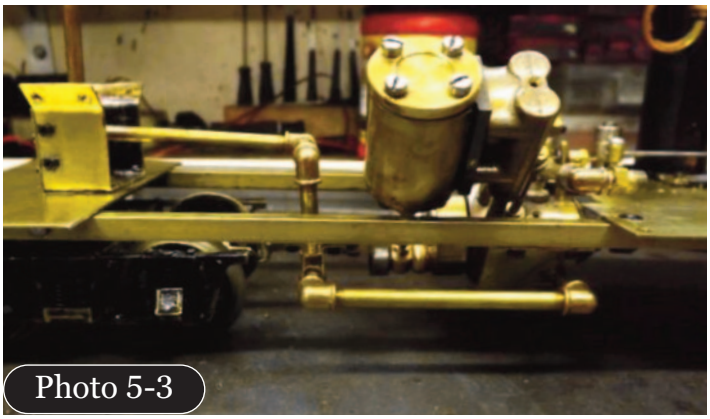


Photo 5-3

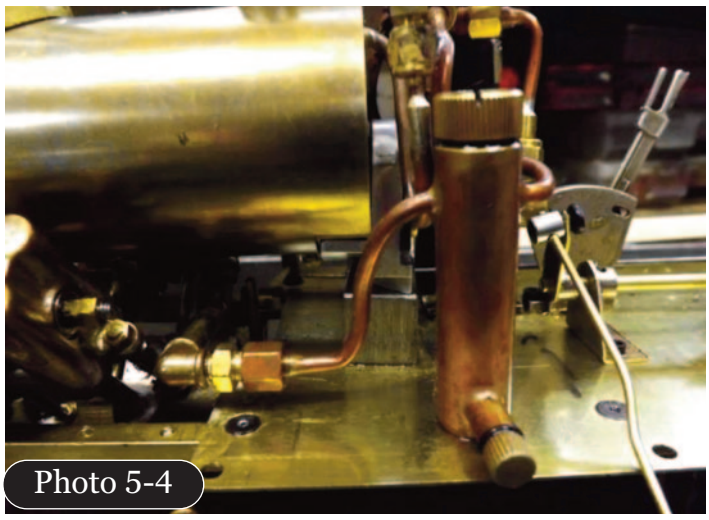


Photo 5-4

on the exhaust piping. Progressively assemble the exhaust piping from the nipple at the engine exhaust (PL-2) to the stack pipe (PL-7). The final pipe in the exhaust line, PL-7, is somewhat longer than necessary. You can cut that to length after installing the smokebox and stack. At that time you might also want to install an exhaust enhancer. Those sound especially interesting on geared locomotives although this locomotive does have some stack talk with just the exhaust piping.

Boiler Mounting

The boiler was test mounted in fitting the smokebox, so this procedure should be familiar. Insert the boiler front into the smokebox. It should go in about three-eighths inch. Mount the boiler to the mainframe using the boiler mount supplied by Roundhouse, the spacer block MF-22 and the long 4-40 cap screw BL-13. The boiler may still be free to rotate, but this rotation will be constrained when all the piping is attached to it.

Gas Tank Base Modifications and Mounting

The gas tank is mounted after bending its mounting bracket to suit. I found that this bracket is soft soldered to the bottom of the tank and can be removed with a small soldering torch without compromising the structure of the tank. On the prototype locomotive, I bent the bracket as shown in the drawings, but on my own West Side locomotive, I made a flat brass mounting base and soldered it to the bottom of the tank. The tapped holes in the new base BL-15 matches the holes in the rear deck and the tank and base can be mounted with two 4-40 screws from the underside of the mainframe. Make sure to orient the gas tank when soldering it onto the new base so the regulator valve is in the right place. Before you unsolder the original tank bracket, make sure the tank is absolutely empty!

Gas and Steam Plumbing

The plumbing of the gas lines or tubing is done as shown in **Photo 5-5** and BL-0 (**Drawing 5-3**). The gas regulator valve in the HBK4 boiler kit is positioned close to the tank. The copper tube from the regulator valve to the burner jet will have to be

—See Page 30

ACCUCRAFT TRAINS
ELECTRIC & LIVE STEAM MODELS

SOUTHERN PACIFIC P-8 CLASS 4-6-2

Engineering Sample Shown

1:32 Scale, 45mm Gauge
Alcohol Fired, Butane Ceramic Fired, Electric
Available in #2467 and #2472
$3,995.00 each, Delivery Winter 2019

ASTER BR 5MT 4-6-0

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Engineering Sample Shown

1:32 Scale, 45mm Gauge, Alcohol Fired
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45mm Gauge
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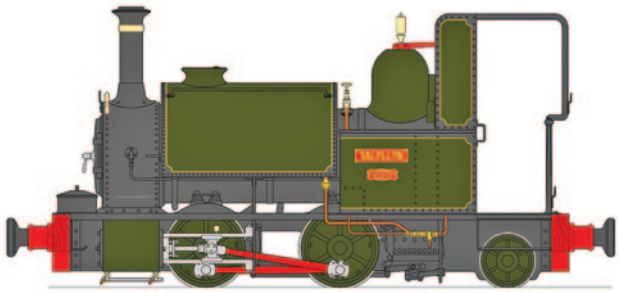

1:19 Scale, 32 / 45 mm Gauge, Butane Fired
Available in TR Green, Indian Red, Black
Taking Reservations, Delivery Spring 2020
$1,700.00 each

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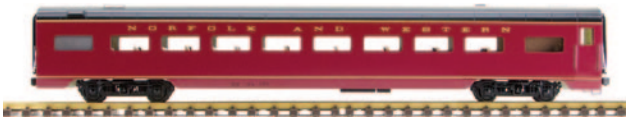
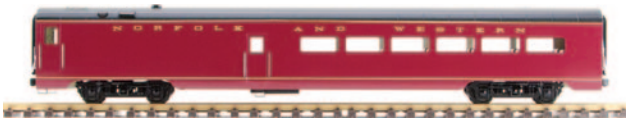
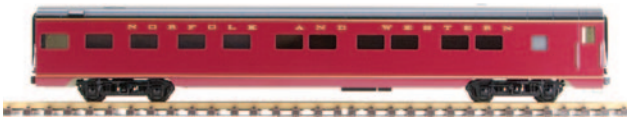
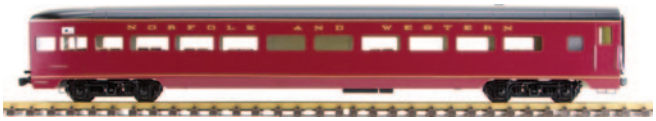
SMOOTH SIDED MODERN PASSENGER CARS


Coach


Baggage Car


Diner Car


Pullman Sleeper Car


Observation Car

1:32 Scale, 45mm Gauge, Die-Cast Trucks, Metal Body
Available in Unlettered, Southern Pacific, Union Pacific, New York Central, Norfolk & Western, and Canadian Pacific
$340.00 / car, $2,040.00 / 6-car set

Bundle Offer: $1,530.00 / 6-car set with purchase of J-class.
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1:13.7 (7/8ths) Scale, 45mm Gauge
Butane Ceramic Fired
Delivery Sep. 2019
$3,200.00 each
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Photo 5-5


Photo 5-6

cut to shorten it. One of the cone fittings on this tube will not be able to be re-used. Shorten and bend the tube as needed and put the tubing nut that came off when you cut the tube back on before soldering a new cone BL-16 onto the tube. See the "Backhead View" on BL-0 (**Drawing 5-3)** and **Photo 5-6**.

The tubing from throttle to lubricator will also require a bit of tricky bending. Be sure not to kink either the gas or steam lines. The top view of BL-0 shows the details of the tube runs from throttle to lubricator and from lubricator to engine piping. The 1.937-inch dimension locating the lubricator drain corresponds to the cutout in the side of the cab, which you will see in the next segment. The drain and cab cutout must line up or the cab won't fit properly. The gas line piping has been omitted on drawing BL-0 for clarity, but the photos show clearly how it is done. Be VERY sure that both the gas and steam piping is tight and there are no leaks. Steam leaks will become evident in operation, but you do NOT want to find out you have a gas leak when lighting the burner!

Boiler Details Safety Valves and Steam Domes

The rest of the details are put on the boiler as shown on **Drawings 5-4 and 5-5**, or to your taste. The Trackside Details castings for domes, bell, headlight or even stack can be substituted with any brass detail parts you choose. This is a live steamer, don't use any detail parts that can't stand the heat! Feel free to improvise and super detail if you want. You may not want to change the steam dome as it was selected to work with the safety valve. This is the only top-of-boiler detail whose position is fixed.

The Wee Bee safety valve, manufactured by Jim Sanders, is available from The Train Department. The special adapter to fit the valve into the filler opening in the Roundhouse boiler must be special ordered from Jim Sanders directly.

BL-3 is a Trackside Details steam dome TD-17 that has been modified to fit over the Wee Bee safety valve so that the safety valve vents through the top of the steam dome. A piece of tubing is pressed through the top of the dome and fits over the Wee Bee valve. This arrangement also keeps the steam dome in place. I have purchased Wee Bee safety valves for a number of my steamers and I am very pleased with their operation. They don't weep at all and result in less wasted steam and water than other types. I have found a manufacturing variation in the outside diameter of these safety valves. This does not affect operation, but may affect the tubing you insert into the steam dome to mount the safety valve. The pilot locomotive used a quarter-inch outside diameter tube; other Wee Bee valves of the same model required a 9/32-inch diameter tube to fit over them. Best to have your safety valve on hand to measure before altering the steam dome to fit it.

The headlight bracket is most easily attached with 0-80 screws to the smokebox. Either tap the smokebox or use through holes with nuts on the inside. The Trackside Details bell base can be soldered to the boiler wrapper or use JB Weld. The chassis is now complete and ready to run.

Initial Steaming

The initial steaming starts the fine tuning process and break-in. Like any maiden voyage, this one may have its ups and downs.

Before steaming for the first time, make sure all components are fit together well, tightened down and running smoothly. The moving parts like the PM engine, trucks and universals should run together well. The chassis should be air tested and any running issues taken care of before going on to a steam test.

Some of the screws holding the main frame together could be Loctite'ed so they are a permanent fit, but not bolster connections or screws holding down the smokebox or pilot braces. Leaving these screws able to be loosened makes removal of the trucks for maintenance and adjustment much easier. To remove the trucks from the mainframe, you can just remove the bolsters.

The Heisler prepares for steaming like any Roundhouse locomotive. The boiler holds eight ounces or one cup of water. Remove the Goodall valve and fill the boiler with six ounces of water to allow for steam expansion space. This is a little less water in the boiler initially than Roundhouse recommends, but the PM engine is more difficult to clear than some others and the less water in the lines the better. Boiler overflow due to expansion upon heating will only aggravate this. Pushing the locomotive to clear the cylinders doesn't work well with a geared locomotive, especially trying to back drive a water-locked engine through 3:1 gearing at a mechanical DIS-advantage.

Fill the lubricator with standard weight steam oil and lubricate the engine with machine oil at the three lube points: the two at the top of each cylinder and the one at the rear of the engine base under the boiler, just ahead of the reversing valve. This last one will be a bit tough to get to so an oiler with a long snout is needed. Lubricate all the drive components: universals, gears and bushings. Fill the gas tank with either butane or a butane/propane mix. (I've never had a firing problem with either one). You will see overflow when the tank is full.

Light the burner as with any Roundhouse loco, crack the gas and put a lighter either over the stack or under the rear of the smokebox. There is no cab at this time to hold in boiler heat to warm the gas tank, so gas pressure will stay lower on this initial run than in later running with a superstructure in place. The system should come up to steam from cold water in six minutes or less. If you want to shorten this time and save your fuel, pre-boil your water in a microwave then add it to the boiler. The Wee Bee safety valve is set to pop off at 40 PSI and this can be verified on the pressure gauge.

When full pressure is reached and the safety valve has popped off, put the engine in either forward or reverse and open the throttle fully (180 degrees or so for a manual throttle) to start to clear the cylinders. Do not push the locomotive manually to clear the cylinders. With the throttle full open, alternate between forward and reverse for a few seconds each way. At first, you will see no reaction whatsoever, looks like nothing is working. It may take 10 or more reversing cycles to get the cylinders to begin to clear. This is the only drawback to the PM engine, it takes a long time to clear the cylinders.

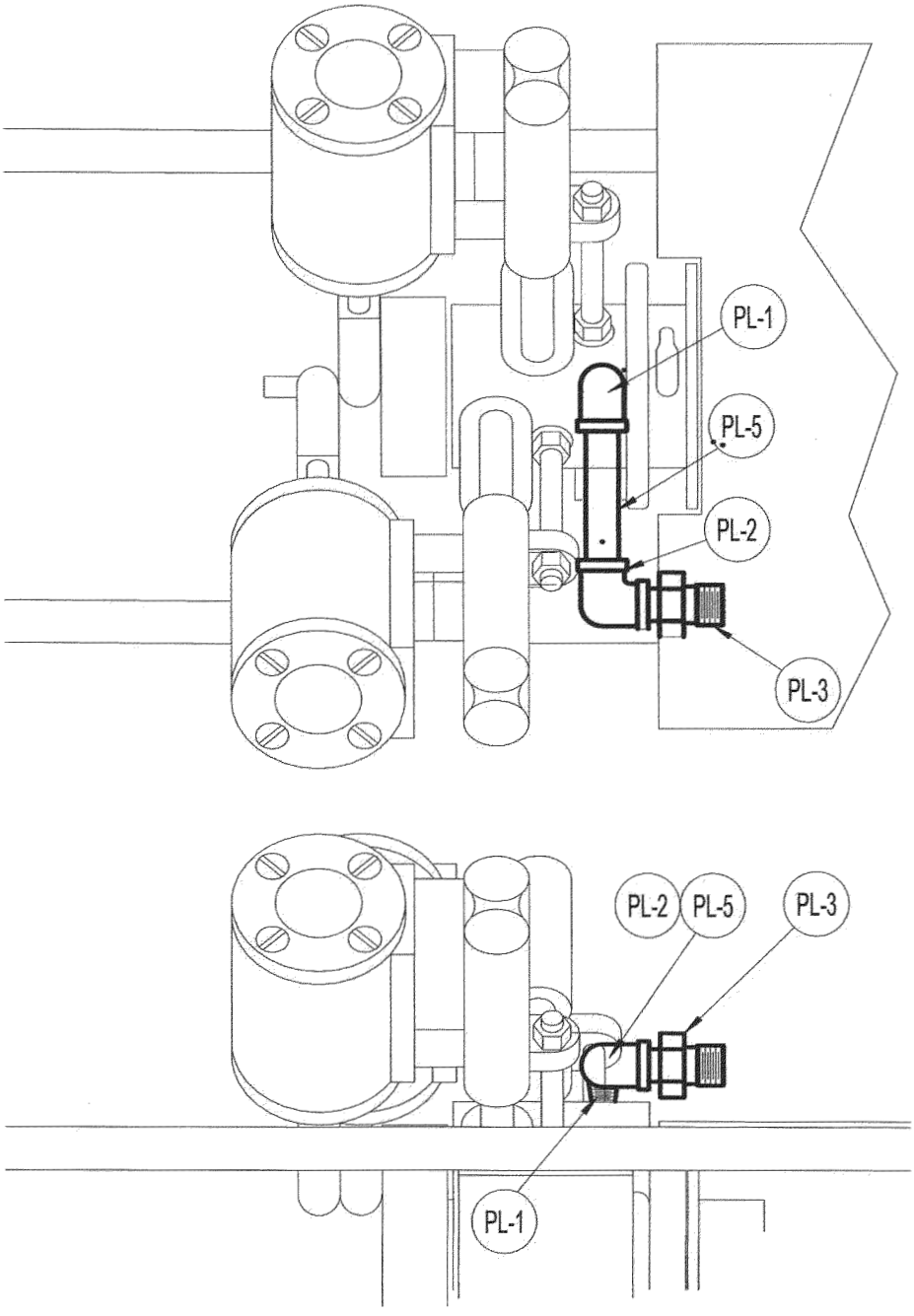
Eventually the locomotive will want to start off on its own and you can cut back on the throttle. Try running forward and reverse, and various speed ranges using either the reversing lever or throttle to regulate speed.

Do not be discouraged if initial runs are rough or the locomotive does not have the power you hoped for. It takes around 10 hours of break-in to get the locomotive to full running potential. I have run in two of them now, and they both ran in the same. At first, the pilot locomotive would slow on tight curves and pull only a few cars with full boiler pressure, but by the time I took it to Diamondhead, it was pulling a nice consist. During the break-in period, the locomotive will also use more water than you'd expect. Ten minutes between replenishments can be expected. This is why the Goodall valve is standard equipment. When adding water with the Goodall, close the throttle. The Goodall filler is directly over the throttle and less water will find its way into the steam lines.

My own West Side Lumber prototype Heisler got off to a slow start, slower than the prototype locomotive. In its case, it was due to break-in, gearing in the trucks running rough due to misalignment, adjustment and setscrews coming loose, and I had the nuts that adjust the hold-down springs on the oscillating cylinders too tight, resulting in too much running friction. You could also get the opposite condition with the cylinder springs. If you have sluggish operation and you see steam leaking from where the cylinders attach to the engine base, steam may be leaking from the oscillating valve faces and the nuts that adjust the hold-down springs may need to be tightened. Note that either

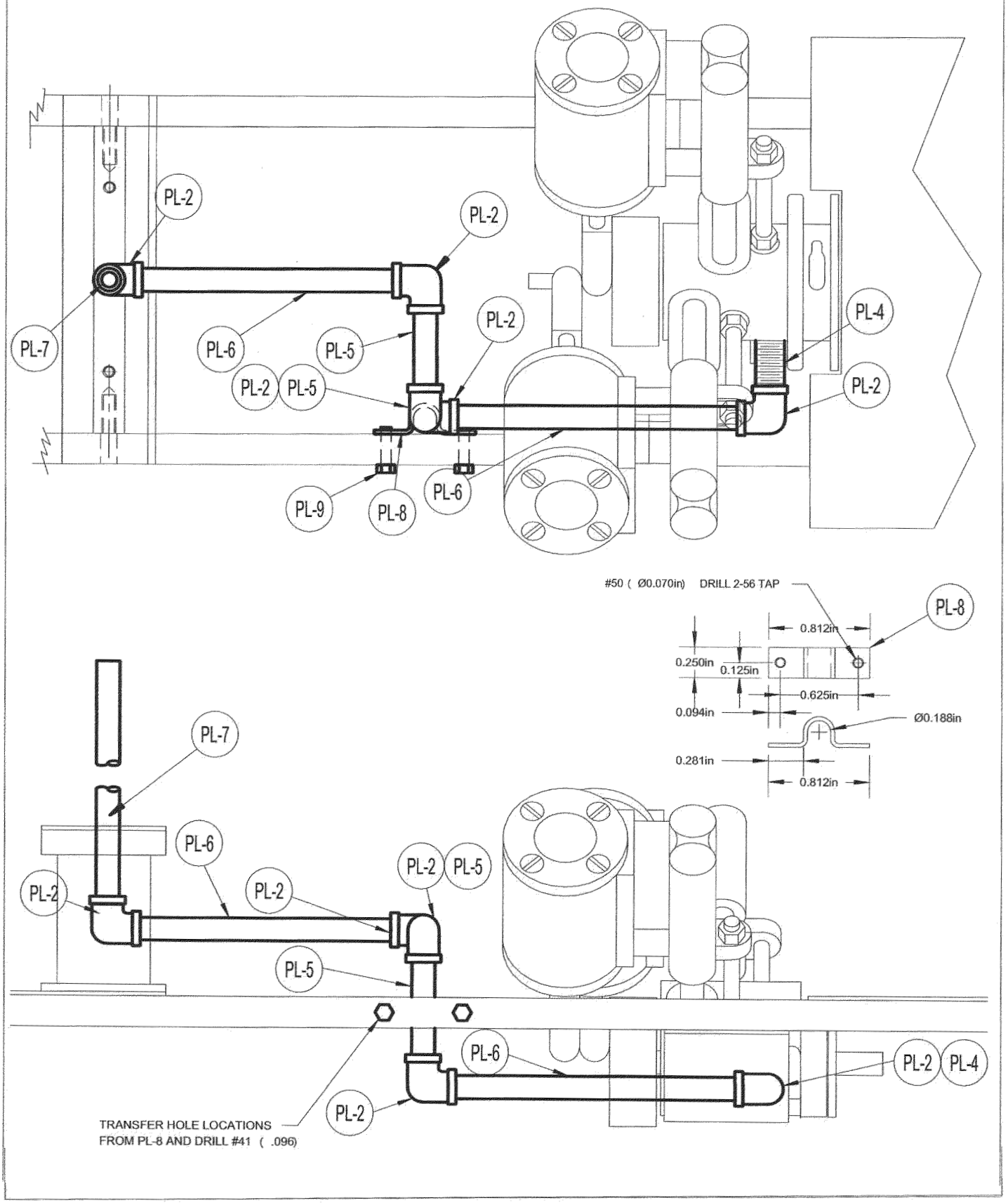
PL-1 PLUMBING DETAILS PAGE 1 STEAM INLET

PART NUMBER	REQUIRED	DESCRIPTION	VENDOR	VENDOR PART #
PL-1	1	STREET ELL, 3/16-40 UST	PM RESEARCH	PS3M
PL-2	7	90 DEGREE ELL, 3/16-40 UST	PM RESEARCH	PL3M
PL-3	1	UNION, 1/8" TUBE TO 3/16-40 UST	PM RESEARCH	TUM34
PL-4	1	NIPPLE, 3-16-40 UST x 1/2"	PM RESEARCH	P3M-.0.5
PL-5	3	NIPPLE, 3-16-40 UST x 1"	PM RESEARCH	P3M-.1.0
PL-6	2	NIPPLE, 3-16-40 UST x 2 1/2"	PM RESEARCH	P3M-.2.5
PL-7	1	NIPPLE, 3-16-40 UST x 5"	PM RESEARCH	P3M-.5.0
PL-8	1	STRIP, BRASS, 032 x .250"	K & S	8240
PL-9	2	SCREW, HEX HEAD, 2-56 x .75	MICRO FASTENERS	HBB0212

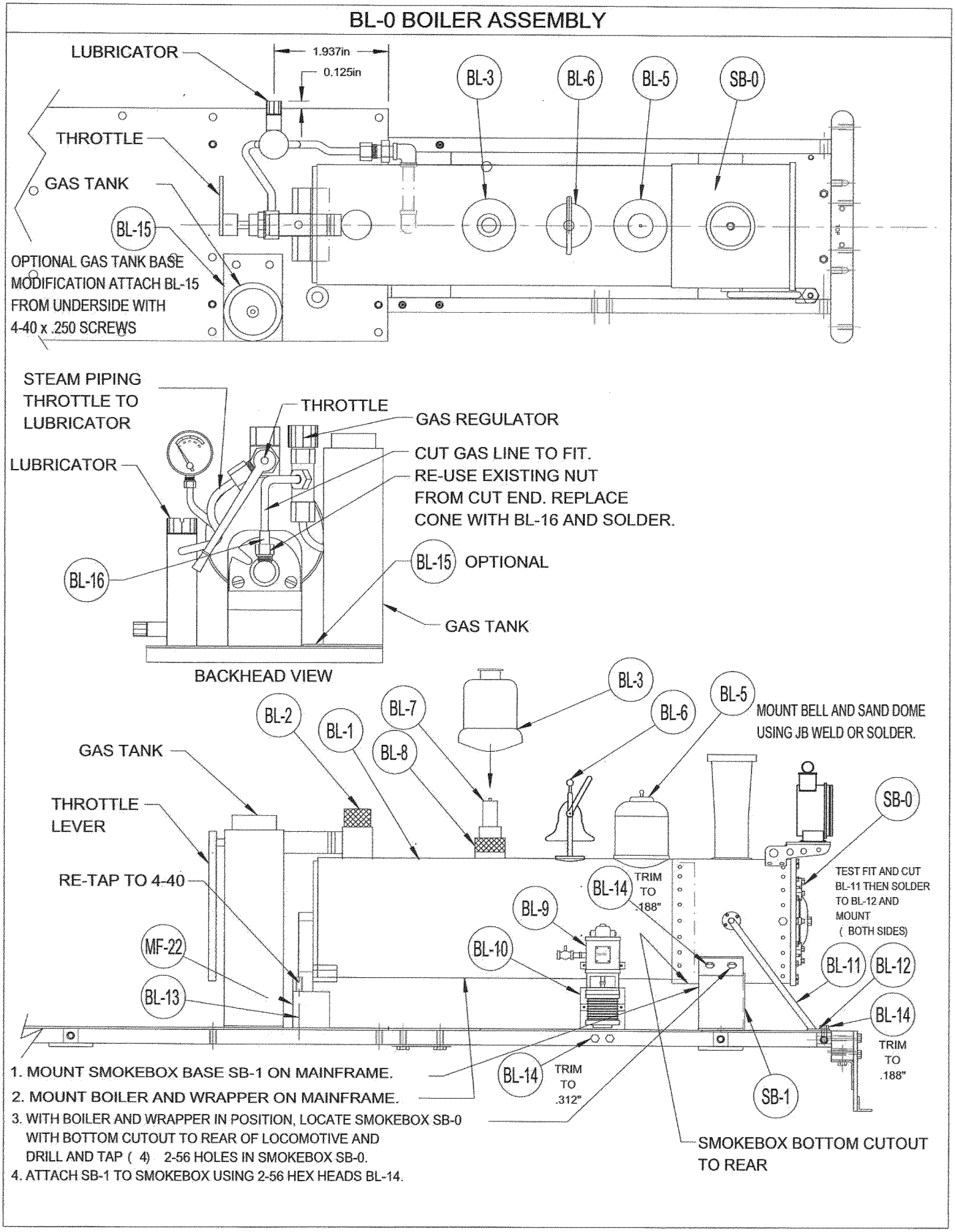


Drawing 5-1

PL-2 PLUMBING DETAILS PAGE 2 EXHAUST



Drawing 5-2

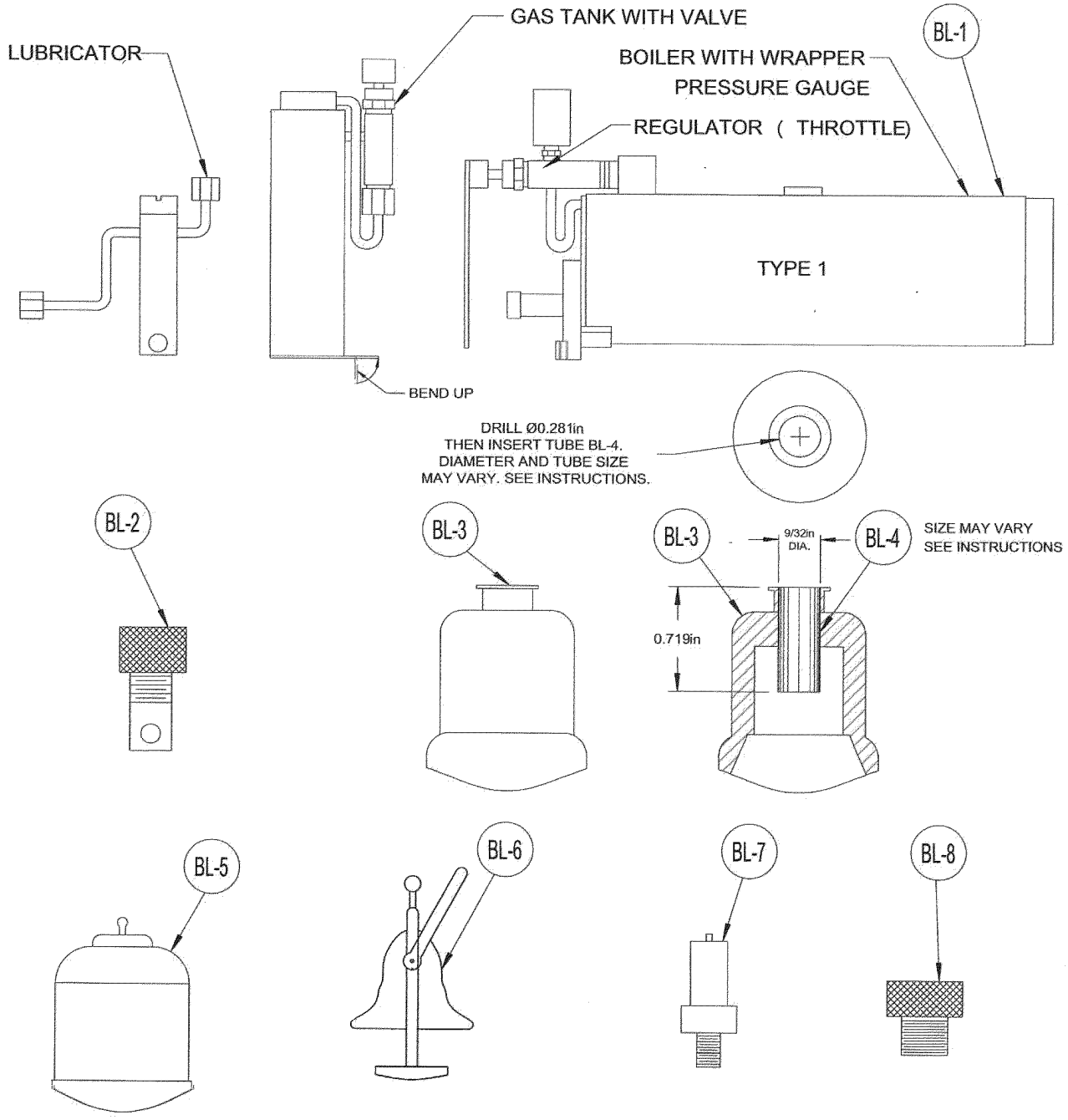

BL-0 BOILER ASSEMBLY
LUBRICATOR
1.937in
0.125in
BL-3
BL-6
BL-5
SB-0
THROTTLE
GAS TANK
BL-15
OPTIONAL GAS TANK BASE MODIFICATION ATTACH BL-15 FROM UNDERSIDE WITH 4-40 x .250 SCREWS
STEAM PIPING THROTTLE TO LUBRICATOR
THROTTLE
GAS REGULATOR
LUBRICATOR
CUT GAS LINE TO FIT. RE-USE EXISTING NUT FROM CUT END. REPLACE CONE WITH BL-16 AND SOLDER.
BL-16
BL-15 OPTIONAL
GAS TANK
BACKHEAD VIEW
BL-2
BL-1
BL-7
BL-8
BL-3
BL-6
BL-5
MOUNT BELL AND SAND DOME USING JB WELD OR SOLDER.
GAS TANK
THROTTLE LEVER
SB-0
RE-TAP TO 4-40
BL-14 TRIM TO .188"
TEST FIT AND CUT BL-11 THEN SOLDER TO BL-12 AND MOUNT (BOTH SIDES)
BL-9
MF-22
BL-10
BL-11
BL-12
BL-13
BL-14
TRIM TO .188"
BL-14 TRIM TO .312"
SB-1
1. MOUNT SMOKEBOX BASE SB-1 ON MAINFRAME.
2. MOUNT BOILER AND WRAPPER ON MAINFRAME.
3. WITH BOILER AND WRAPPER IN POSITION, LOCATE SMOKEBOX SB-0 WITH BOTTOM CUTOUT TO REAR OF LOCOMOTIVE AND DRILL AND TAP (4) 2-56 HOLES IN SMOKEBOX SB-0.
4. ATTACH SB-1 TO SMOKEBOX USING 2-56 HEX HEADS BL-14.
SMOKEBOX BOTTOM CUTOUT TO REAR

Drawing 5-3

BOILER ASSEMBLY DETAILS PAGE 1

PART NUMBER	REQUIRED	DESCRIPTION	VENDOR	VENDOR PART #
BL-1	1	LADY ANNE BOILER KIT, LESS SMOKEBOX AND SAFETY VALVE	ROUNDHOUSE ENGINEERING	HBK4
BL-2	1	TOP OFF (GOODALL) VALVE	ROUNDHOUSE ENGINEERING	WTUV2
BL-3	1	STEAM DOME	TRACKSIDE DETAILS	TD-17
BL-4	1	TUBE, BRASS, 9/32* OD x 23/32	K & S	8132
BL-5	1	SAND DOME	TRACKSIDE DETAILS	TD-16
BL-6	1	BELL KIT	TRACKSIDE DETAILS	TD-181
BL-7	1	SAFETY VALVE WEE BEE 40 PSI M5 x .5	THE TRAIN DEPARTMENT	WB100A
BL-8	1	ADAPTER WEE BEE (M5 x .5) TO 3/8-24 THD.	JIM SANDERS	SPECIAL ORDER

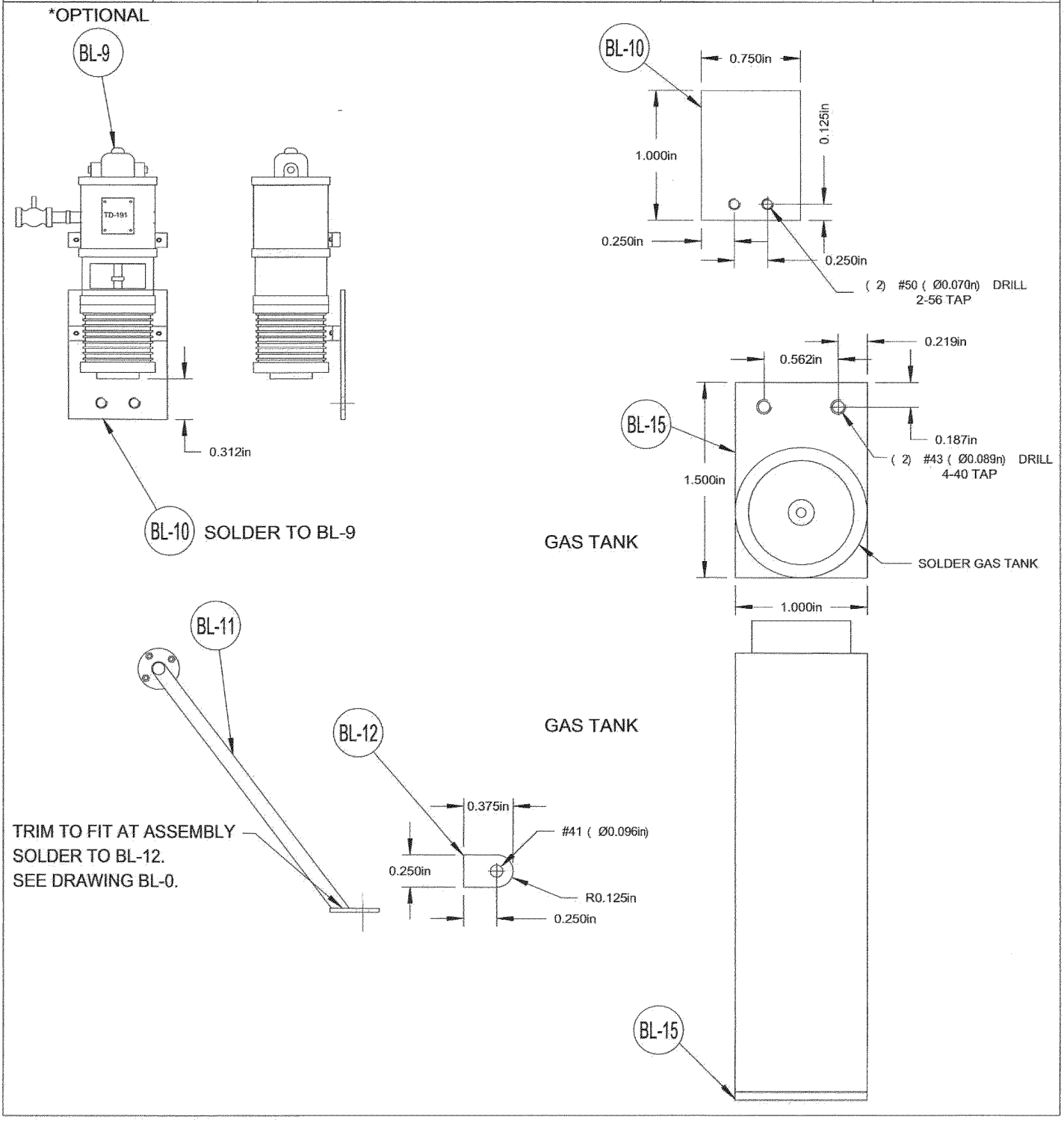
*DIAMETER MAY VARY. SEE INSTRUCTIONS.



Drawing 5-4

BOILER ASSEMBLY DETAILS PAGE 2

PART NUMBER	REQUIRED	DESCRIPTION	VENDOR	VENDOR PART #
BL-9	1	COMPRESSOR	TRACKSIDE DETAILS	TD-191
BL-10	1	STRIP, BRASS, .032 x .75	K & S	8243
BL-11	1	PILOT BRACE AND FLANGE (2 IN PACK)	TRACKSIDE DETAILS	TD-143
BL-12	2	STRIP, BRASS, .032 x .250	K & S	8240
BL13	1	SCREW, SOCKET HEAD, 4-40 x 1.00	DU BRO	312
BL-14	8	SCREW, HEX HEAD 2-56 x .75	MICRO FASTENERS	HBB0212
BL-15*	1	STRIP, BRASS, .064 x 1.00	K & S	8248
BL-16	1	UNION CONE, .125	PM RESEARCH	TUC4



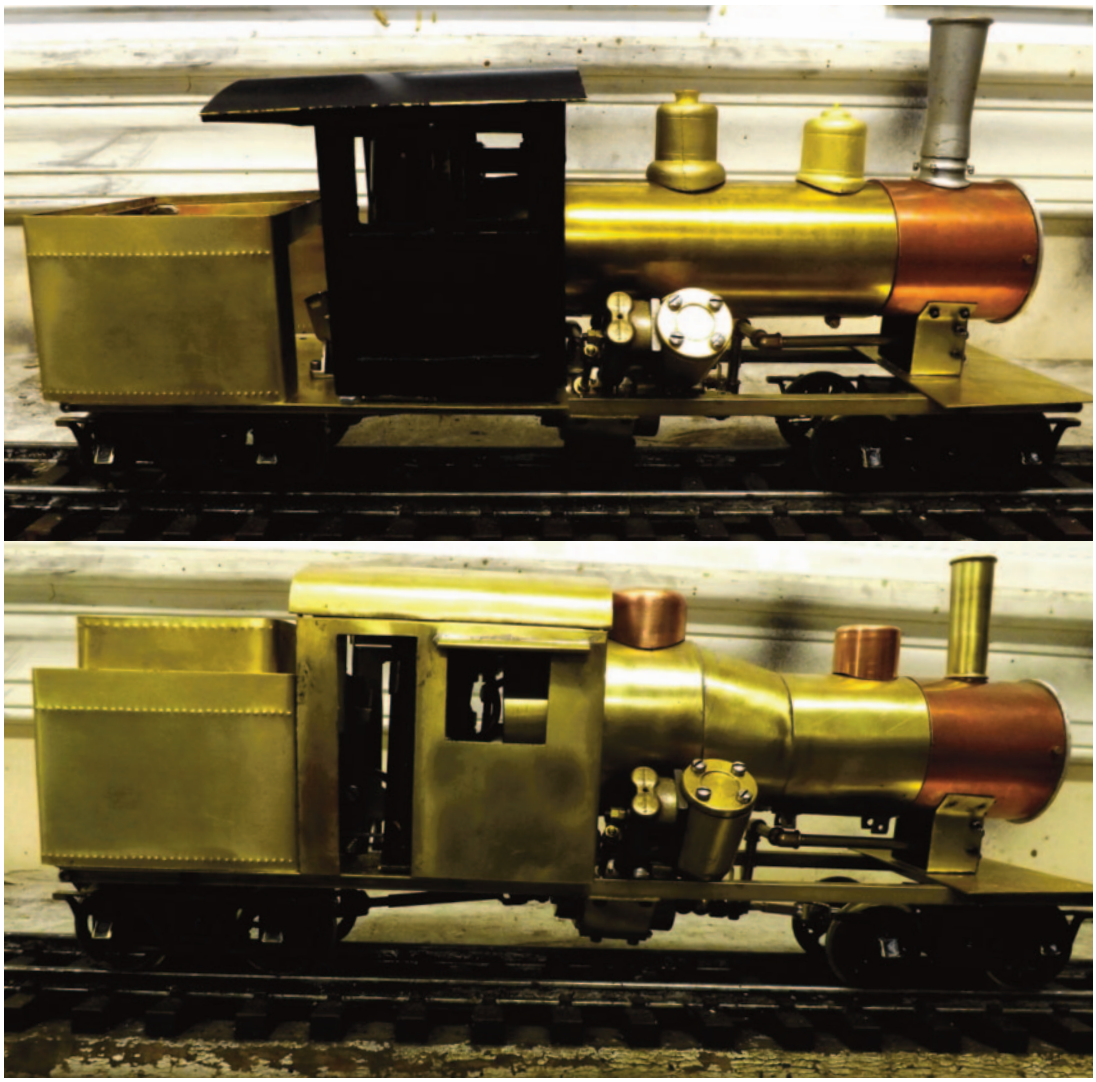
Drawing 5-5

condition could also occur at the rotary reversing valve, and its hold down spring may need adjusting, too. Either set of springs could be too loose or too tight, and the initial steamup is a good test. You don't want the reversing valve springs too tight as it will make the Johnson bar too hard to work and could burn out a servo if you are using R/C. When correctly tightened, I have found there is no detectable steam leakage from either the oscillating valves on the cylinders or the reversing valve. The PM engine is the most steam-tight oscillating cylinder engine I have ever had the pleasure of running. Happily, the run-in period is over and with the manual throttle turned approximately 120-180 degrees and speed and direction both controlled by the PM engine's reversing valve, this locomotive is now both a powerhouse and, if I'm not careful, a speed demon. In my wife's words: "It just WANTS to go." In the course of running, it is a good idea to check the tightness of screws, etc. from time to time.

After break-in, both water consumption and pressure requirements will decrease and pulling power will increase. This locomotive will always consume somewhat more water more quickly than a rod locomotive of the same size, so a Goodall valve is indispensable for longer runs. The cylinders are taking three times as many strokes to go the same distance as a rod locomotive. It may consume some steam, but the PM engine is a smooth, strong runner and is a great performer in this locomotive when properly adjusted and run in. All I can say is have faith, the break-in period will pass, the performance improves by the hour and you will have a locomotive chassis you will enjoy running. I speak from experience.....twice.

In the next issue we will wrap things up and put a cab, bunker and other finishing details on this locomotive, making it pretty and completing the project... until you start adding your own touches!

Next Issue: Finishing the Heisler - Cab and Fuel Bunker



Which way will you go with your Heisler?

Left Top Photo - Freelance Heisler with the look of the Pacific Coast Borax Company.

Bottom Left Photo - Westside Lumber Company style cab and fuel bunker with a wagon top boiler wrapper.

Send us photos of your build and we'll share them here in preparation for the grand finale of this construction series.

How NOT To Buy A Locomotive

Text & Photos by
Patrick McConnell

The restoration of an irresistible "deal"

When you go to a steamup, do not tell yourself or your fellow steamers who know better that you intend on not buying anything. This is precisely when the "deal" appears.

Such was the case at the 2018 National Summer Steamup. Having already maxed out my garden railway budget for the year, I was not in a position to add anything else to the stable, but low and behold, I spied a forlorn-looking Accucraft Heisler that looked to be a victim of a minor nuclear explosion. It looked like it might be too far gone to save and not worth the time, effort, or grief; not to mention that I might not have the skills to fix it. So naturally, I bought it. As it turns out, it had been in a garage fire, which explained the lingering BBQ smell, but it fared pretty well compared to its melted stablemates. With a valuable second opinion from a veteran steamer, I determined that the damage was mostly cosmetic and that the mechanics were sound. I paid only roughly double of what it was probably worth and proudly carried it over to my table amongst cries of dismay from fellow steamers. I was not deterred, however, because it was a "deal".

To find out just how good of a "deal" I got, it was imperative to find out if the Heisler would come back to life. The first order of business was to remove some of the loose bits of charred material and lubricate the locomotive top to bottom. **(Photos1 & 2)**. I decided against fully steaming the engine until it was rebuilt, but I determined it was safe to try on air, so I gently applied pressure to the boiler, moved the Johnson bar into the forward position and cracked the throttle. I wouldn't say it sprang to life but it slowly worked itself into a lively trot.

It was then time to pull the thing apart. Now, I don't know exactly how many people there are looking for a how-to article on how to fix a burnt-up Heisler, but the general premise of this article is to provide some guidance for those who have never cracked open and worked on a live steam locomotive. (Please note: I'm not a professional and all following advice is to be taken with a grain of

Photo 1

Photo 2

salt. I only know enough to get me in trouble).

Disassembly

To many, this is the easiest part of a project, and unfortunately some like myself make it the fastest. If you have any sense of forethought, take some extra time during this phase to familiarize yourself with the locomotive; take pictures, jot notes, draw diagrams, and organize as best you can. It's also probably best to stick with decaf coffee on that particular day. There are a few important points to cover in regards to disassembly, the first being how the locomotive is constructed or, to be more relevant, how it can be deconstructed.

Start with as many detail parts as you can then slowly work your way into the bigger components. When removing parts, particularly details, please note that they may not be attached in a fashion you were expecting. A few examples of this on the Heisler: some of the tubing threads directly into a larger piece, while others have nuts on the reverse side; some of the bolts that hold pieces together were soldered in place (undiscovered until the head of the bolt breaks off). Also, regarding how the locomotive is constructed, often times a piece which seems like it should come right off with minimal work actually require further disassembly before it can be removed. (This is a good time to take notes on the order in which the engine should be assembled.) **(Photo 3)**. This point was emphasized when trying to remove the boiler and cylinder assembly. On most locomotives, the boiler is an integral part of the engine's structure, so know that there will be a fair amount of disassembly before it can be removed. Once it is removed, be wary of the frame's now flexible and vulnerable state. The cylinder assembly proved quite challenging as I

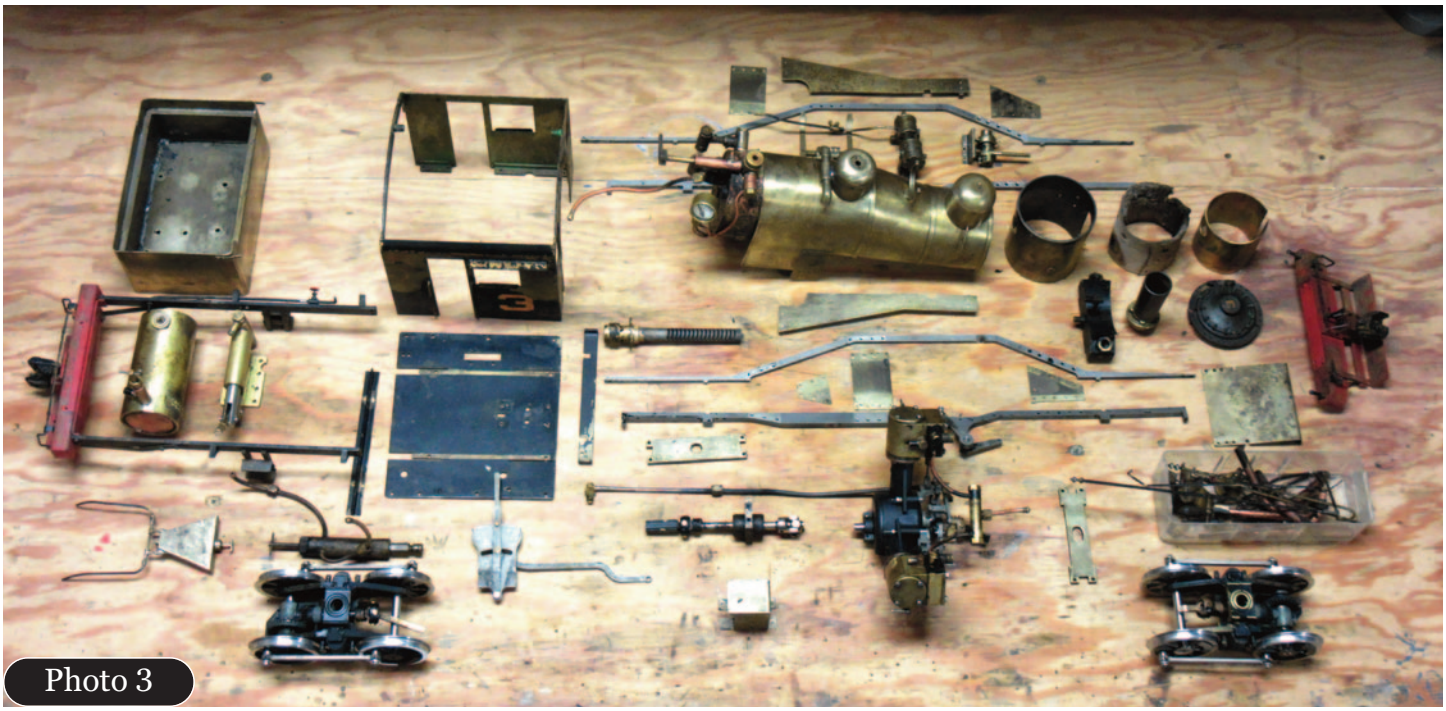


Photo 3

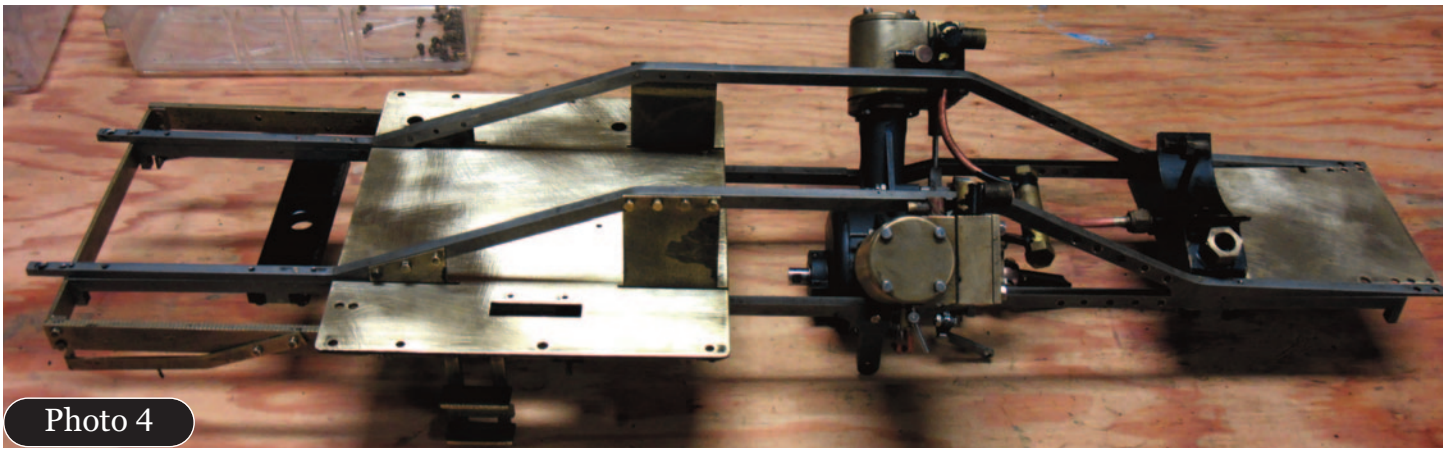


Photo 4

was sure it would come out after the boiler and that I would be able to keep the frame together; not so. It ended up being sandwiched between the locomotive's unique split top and bottom frame rails, and the whole frame had to come apart. **(Photo 4**).

The second important point in disassembly is keeping your parts organized. I will present two basic methods for organizing parts and their respective fasteners. The first method is to keep a particular part and its related fasteners together in a small container or bag. The advantage of this method is that you can be sure you know exactly what fasteners are used to attach a particular part, but the drawback can be that multiple pieces are assembled in unison with the same fasteners, and determining how to separate the fasteners can be confusing.

The second method, which you will inevitably resort to when your organizational efforts for the first method fail, is to separate the pieces from their fasteners and organize the fasteners in small containers according to type and size. I find that this method is far less tedious but it has one large drawback; unless you took notes on which fasteners are to be used on certain parts, you'll just have to make an educated guess upon reassembly.

One final point I would like to make about disassembly — before you even start, determine what your goal is and how much you need to take apart to accomplish that goal. Are you cleaning, painting, kitbashing, etcetera? When it comes to tiny parts and complex machinery, the less you take apart the better. As the saying goes, one thing leads to another, and with the Heisler, I admittedly tore it down further than I anticipated, but it worked out well in the end. The more you take apart, the easier it will probably be to clean, paint, kitbash, etcetera, but the harder it will be to put back together.

One area that I heavily caution against disassembling is the drive train, which will have crucial adjustments such as valve timing, chain drives, or gears set to factory specifications. If you must take apart these areas, do your best to mark or record factory settings for reassembly, but be prepared that further adjustments will then be necessary. The two pieces that I left relatively "whole" were the trucks for the sake of the bevel gear settings, and the cylinder assembly for the sake of the valve timing. These pieces were very tedious and time consuming to clean and paint but time spent with some Q-Tips and cleaning solvent will save you effort in the long run.

Cleaning/Paint Prep

One of the many aspects of this hobby that I openly admit not being an expert in is painting. It is a long, tedious job with no guaranteed results. So in this section I will explain my methods and processes which you can certainly use as a guide, but know that there are probably better methods out there.

Compared to their electrically-powered plastic counterparts, live steam locomotives go through a lot of wear and tear which inevitably affects their outward appearance. After many years of faithful steaming a locomotive may look a little tired, which some wear as a badge of honor, while others are best tidied up and treated to a mechanical/cosmetic refresh. Another reason to repaint a locomotive might be to suit one's personal tastes or because it is not available in a desired prototypical color scheme. Sometimes, locomotives catch fire and stay on fire for quite some time; these are called alcohol-fired engines. Because of other cir-

cumstances, my Heisler was subject to an inferno which left only hints of the factory finish. Whatever the reason for repainting, try to maintain as much of the factory paint in the overall scheme as possible, as several companies use lacquer paint which is generally very durable but difficult to replicate.

Assuming you've disassembled the locomotive to a necessary state, the next step is to clean it and prep it for paint. We will go over three main stripping techniques: scraping/wire brushing, sanding, and chemical stripping. If you're painting over a factory finish in good condition, don't bother stripping the parts down to bare metal as the factory finish is a solid base to work off of. If your loco is like mine, then there is little left of the factory finish and it needs to be removed.

Scraping/Wire Brushing: This is the simplest and least technical method requires little explanation. Since most of the remaining paint on the Heisler was flaking off, I used a paper-thin, non-sharp, and flexible hand blade to scrape it off **(Photo 5)**. The type of tool you use for scraping is important because it can't be too aggressive or it will scratch or gouge brass, the primary ingredient of our engines. The uses for scraping can be limited, but it can be useful for small spots of stubborn paint or large areas of weak paint. Small handheld wire brushes (about the size of a toothbrush) can be used generously and are great for small, intricate parts, but they are usually on the soft side and are limited to what they will actually remove.

Sanding: Again, not a lot of explanation required but a few pointers. You shouldn't have to use anything more aggressive than 200 grit and I caution against it for fear of scratching the metal. 200 usually will even out rough spots and is good for creating a consistent surface. I use 600 grit for most surface prep after 200. For areas of polished metal such as a bell, I use 1000 grit followed by 00 steel wool.

Chemical Stripping: If you use this method, do not attempt it without a proper face mask/respirator, eye protection, appropriate gloves, and maximum skin coverage. Avoid this method if you can and if required, use it sparingly, because chemical strippers are some pretty toxic concoctions that don't do your skin, lungs, and brain any favors. Sometimes, it is inevitable and can be helpful with tricky finishes. One such area on the Heisler where I resigned to using a stripper was the tender, which

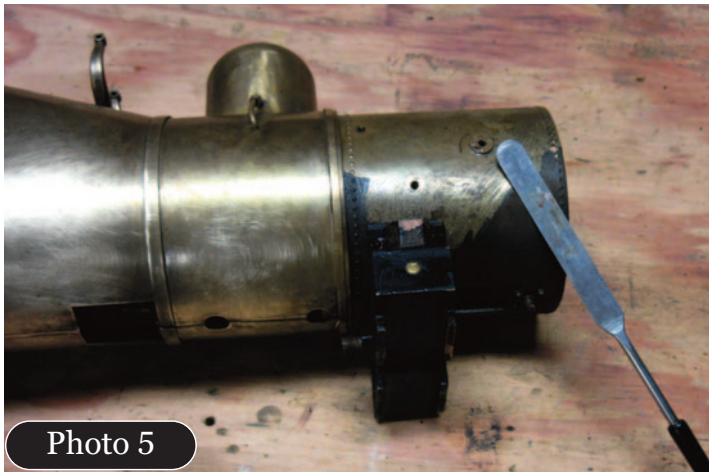


Photo 5

still had most of its factory paint intact and was proving difficult to get off. I used a hardware store-grade stripper for general home uses which worked fine with a bit of fussing. I know some people use aircraft-grade stripper which I hear can melt diamonds if given the chance, so if you still have all your body parts intact after using it, let me know your thoughts. I got the best results with the chemical stripper when I scuffed the surface before applying it, which allowed it to penetrate the finish. After the paint boils, I use one of my wire brushes to efficiently remove the bulk of the paint. It's a messy job and often takes several rounds to remove everything but it's good for tough finishes and intricate pieces.

So, you've removed the paint that you needed to and it's time to clean up the remaining gunk and residues. Many mechanical parts can build up grime which can be hard to clean with a gentle wipe-down, so we move to stronger methods. Arm yourself with a clean, medium-sized dish tub and several toothbrushes (and get the quality stiff ones, not the cheap feather dusters you get at the five and dime).

I first try using vinegar which is usually quite effective, especially if the parts are left to soak in it overnight. This solution is nice because vinegar is cheap and non-toxic. If vinegar doesn't do it, I use a parts-washer solvent for automotive use which can be found at most hardware stores and auto parts stores. In the case of the Heisler, after sitting in the inferno, the grease and grime was baked on, so I ended up using an engine degreaser, again for automotive applications.

This next step is EXTREMELY IMPORTANT: whatever you end up using to clean your mechanical parts, it is imperative that you thoroughly rinse

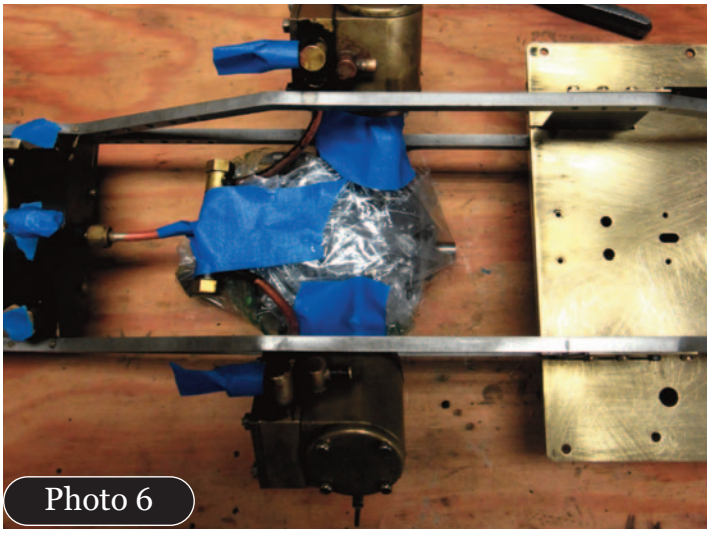


Photo 6


Photo 7

all the parts with clean water, preferably distilled. The reason for this is that most cleaning solutions leave a residue which will repel lubricants, resulting in swift deterioration of moving parts.

My final step of surface prep before painting is to wipe all surfaces to be painted with paint thinner and blow off lingering dust particles with compressed air.

Painting/Assembly

Before your locomotive is reborn, I suggest you take this opportunity to lubricate hard-to-get-to moving parts while the engine is still in pieces. Also, plan ahead and order new gaskets and seals for things like cylinders, steam lines, valves, etcetera as it is not only a convenient time to replace these, but preventing leaks will help to preserve your new paint job.

I'd like to say that painting and assembling is as simple as that: paint, then assemble. However, it is often is the case that many parts of the locomotive will have to be assembled then painted, or painted then assembled then painted again, etcetera. There are two reasons for a sometimes illogical order of operation; the way in which the engine is built and assembled requires it, or to achieve a consistent finish. The first scenario occurred when assembling the frame, which I initially thought could be mostly assembled then painted with no issue. However, if you remember from the disassembly discussion, the cylinder assembly is sandwiched between the top and bottom halves of the frame. This meant that since I wanted to paint the frame as a whole (which I recommend), I had to build the frame around the cylinder assembly, which I then masked off to protect the moving parts from paint **(Photo 6)**. Once the frame was painted, I then went back and painted the now-installed cylinder assembly by brush **(Photo 7)**.

The second scenario is to achieve a consistent finish, which I also ran into with the frame. There are about two dozen individual pieces that make up the basic frame which I could have painted separately then assembled, but fitment might be a bit challenging and you'd have about a million (I lost count after 10) exposed brass bolt heads staring at you and some odd-looking gaps. Painting the frame as a whole resulted in a surprisingly well-executed consistent paint job which included all the shiny bolt heads. So, as you can see, the painting and assembly process requires some forethought and careful planning to determine the best order of operations.

Having earlier given a disclaimer, I'd like to now discuss the actual painting. Most people use rattle cans to paint their projects while others are equipped with an airbrush. Both parties will probably at some point use a brush for certain areas, and some people use only a brush. It doesn't really matter what you use but more how well you use it. Personally, I've come up with a foolproof method for a flawless finish every time – there's no such thing as a bad paint job because any "error" can simply be passed off as weathering or prototypical realism. Paraphrasing a quote from an engineer on a logging railway, "Back then, most locomotives were sanded with bricks, painted with live chickens, and buffed with a pinecone." You can see the ingenuity in my method.

On to more technical matters, when I think of

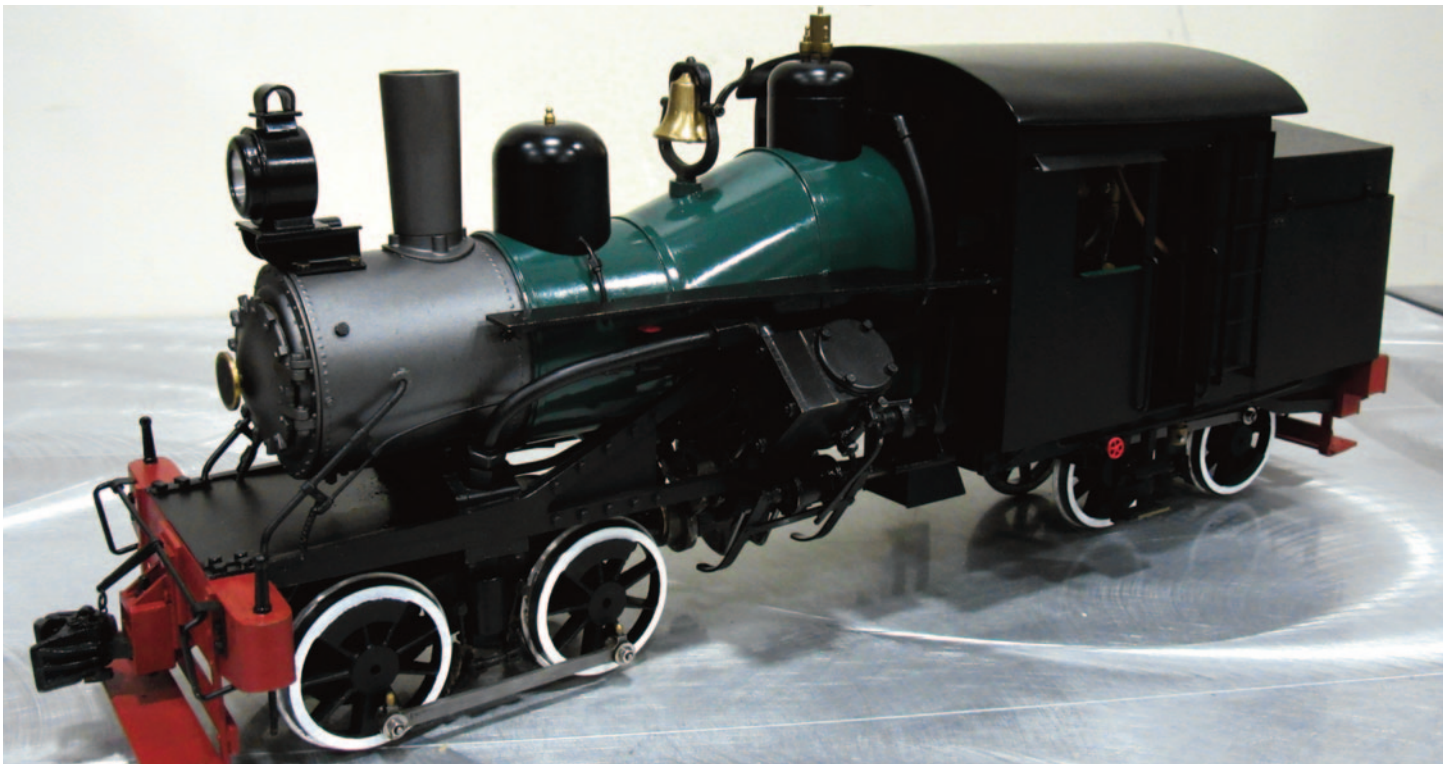
paint and live steam, I think of high temperature paint. Now, no need to paint the whole thing with 2000-degree-proof paint, but I focus on the hottest areas such as the boiler, if not insulated, and specifically the smokebox. Again turning to automotive products, I used a high-heat primer and engine paint for these areas. (I use a special paint for exhaust manifolds for the smokebox.) Otherwise, I find that most spray and brush-on enamels are generally durable enough to last quite a while. I also know some people who have had good success with powder coating, which is both easy and extraordinarily durable, but does have its drawbacks such as the thickness of the coating and melting soft solder. Everyone will have different techniques for painting and to some, my method may seem a little medieval, but just remember, that smudge on the firebox is part of the fully-intended weathering.

Final Notes

After using a small paint brush to touch up all those shiny bolt heads you'll be anxious to get your engine under steam, but here are a few things to remember before that happens. The first and most important is lubrication. Hopefully you took the time to lubricate all the hard-to-reach moving parts while the locomotive was apart, but take a moment now to go through the engine once again to be thorough. When first firing your engine after any paint work, remember that it will take several heat cycles for the paint to fully cure. Until the paint fully hardens, it will be "soft" and will stain easily, so plan your first runs accordingly. The Heisler, luckily, is fitted with cylinder drain cocks, so most of the condensation and oil buildup is deposited harmlessly onto the track while the cylinders are clearing, but I also put a piece of silicon tubing down the stack and over the exhaust pipe and pointed it away from the locomotive. Be careful when wiping your locomotive after the first few runs so as not to smear "soft" paint or scratch the finish.

When first firing your engine after an overhaul, chances are it isn't going to run great, if at all, so don't get discouraged. A few common issues that may crop up are clogged steam line or gas jet, poorly seated seals/gaskets, timing out of adjustment, misalignment of moving parts, etc. While the Heisler did run the first time, performance was sluggish. There was an issue with bad gaskets and a partially clogged steam line. Take time to slowly work your way through the locomotive and ask for a second opinion when issues aren't obvious.

Although I don't have highly technical advice to offer, hopefully this article is a good start to those who have not performed major work to a locomotive. If you find that a task or necessary repair is beyond your skills, reach out to the steaming community and you'll be hard-pressed not to have several people willing to assist.



Bob's Bit's

Weekend Projects for Steamers
by Bob Sorenson
CAD by Dan Pantages

Low Profile Safety Valve

Today's project is a small, low profile, adjustable safety valve with a pressure range of 15 to 75 PSI. The valve uses a one-eighth-inch diameter hardened stainless steel ball as the valve seat. It consists of five total parts, two of which are commercially available. The remaining three parts are from brass bar stock. The valve features a locking nut on the bonnet to prevent accidental disturbance of the pressure setting.

Before starting on the valve body modify a 5/32-inch diameter drill bit in order to cut the valve seat for the one-eighth-inch ball. As shown in **Photo 1**, grind the old point off the bit to an angle of about 15 degrees and at the same time, relieve the front edge by about seven degrees. This bit will cut a nice 15 degree knife edge for the valve seat. Traditionally, a special made "D" bit is used to cut valve seats, however, in this small size, a modified drill bit works just as well.

Machine the valve body from 7/16-inch diameter hex brass stock as shown in **Drawing 1**. Start by turning the stock to 5/16-inch diameter for a length of 3/16-inch. Thread with 5/16 x 40. Part off the stock to a little over three-eighth inch total length. To finish the valve body, make a holding fixture from three-eighth inch hex brass. Drill and tap the fixture with 5/16 x 40. Photo 2 shows the partial valve body and holding fixture. Chuck the fixture with valve body in the three-jaw chuck. Drill thru with #39 drill. Next drill with 5/32-inch to a depth of 9/32-inch. Use the modified 5/32 drill to cut the valve seat to a depth of 5/16-inch, as shown in **Photo 3**. Finish the valve body with 3/16-inch x 40 tap to one-quarter inch depth, as shown in **Photo 4**.

The bonnet (**Drawing 2**) is a straightforward turning from quarter-inch hex brass stock. Turn the stock to 3/16-inch diameter for 9/32-inch length. Thread with 3/16 x 40. Drill #31 to a depth of 1/16-inch and thru with #50 drill. Part off to a length of 13/32-inch. The jam nut (**Drawing 3**) is a

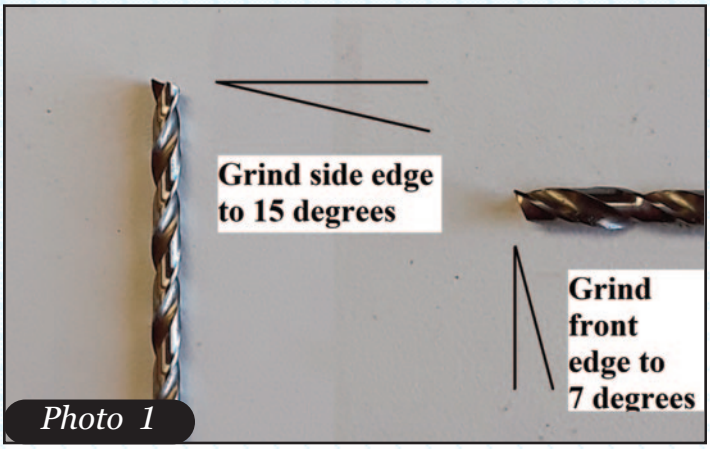


Photo 1

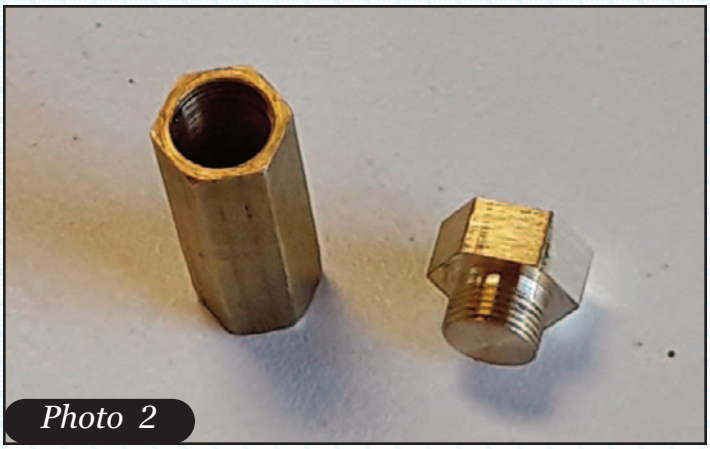


Photo 2

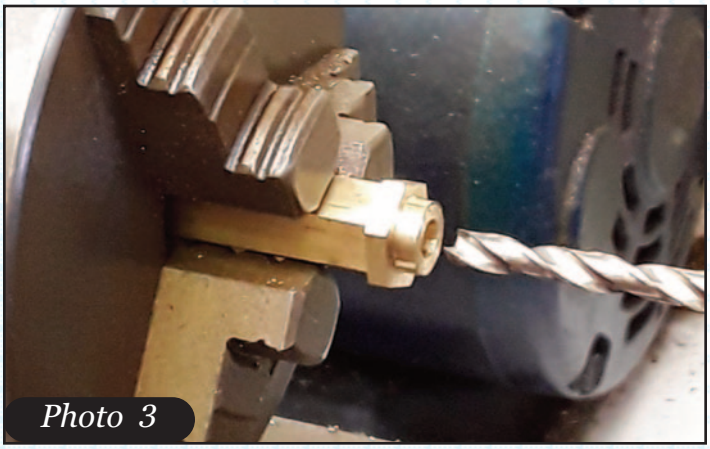


Photo 3

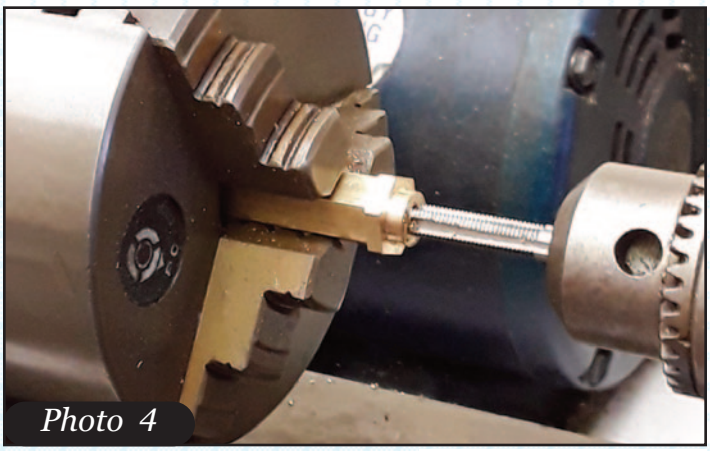


Photo 4

3/32-inch length of quarter-inch hex brass, drilled and tapped with 3/16-inch x 40.

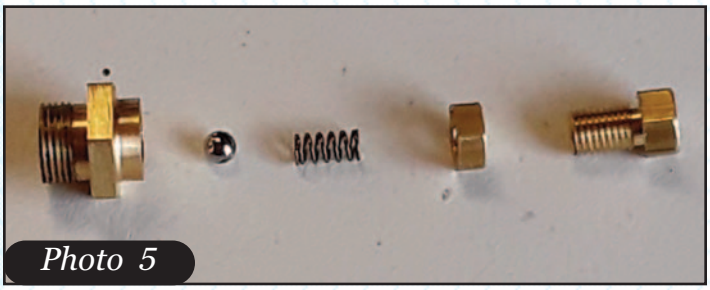


Photo 5

The commercial parts are a one-eighth inch diameter stainless steel ball. Use McMaster-Carr part number 9642K29. The spring is stainless steel with a free length of 0.250-inch, OD 0.120-inch and wire diameter of 0.016-inch. Use McMaster-Carr part number 9435K11.

Photo 5 shows all the parts ready for assembly. Start assembly by seating the ball in the valve body. Drop a ball into the valve body and with a 5/32-inch drift, tap the ball lightly with a small hammer, as shown in **Photo 6**. How much to tap is a matter of "feel." Just enough to seat the ball air tight, but not too much. Next screw the jam nut on the bonnet and insert the spring into the recess. Screw the bonnet into the valve body and assembly is done (**Photo 7**)

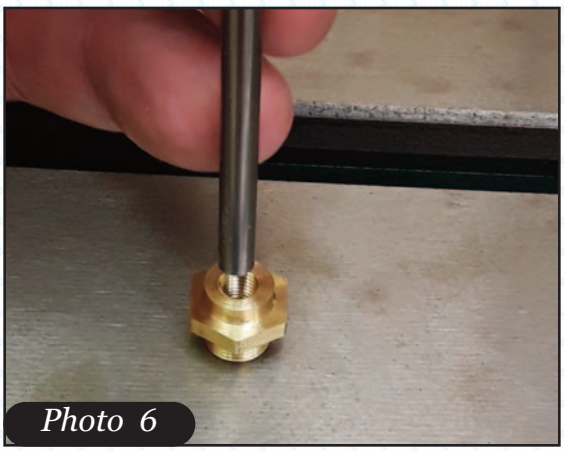


Photo 6

Set the blow off pressure using a regulated compressed air source. **Photo 8** shows a test manifold I made from common plumbing parts. The regulator on the left is in addition to the regulator on the air compressor. The larger pressure gauge on top gives a better reading then the gauge on the regulator. Since I want this valve set at 20 PSI, a 0-30 PSI pressure gauge is sufficient. Set the regulator to the desired pressure. Loosen the bonnet and listen for air flow out of the safety valve. Tighten the bonnet until the air flow just stops. Tighten the jam against the valve body and test again. **Photo 9** shows 20 PSI, right on the money.

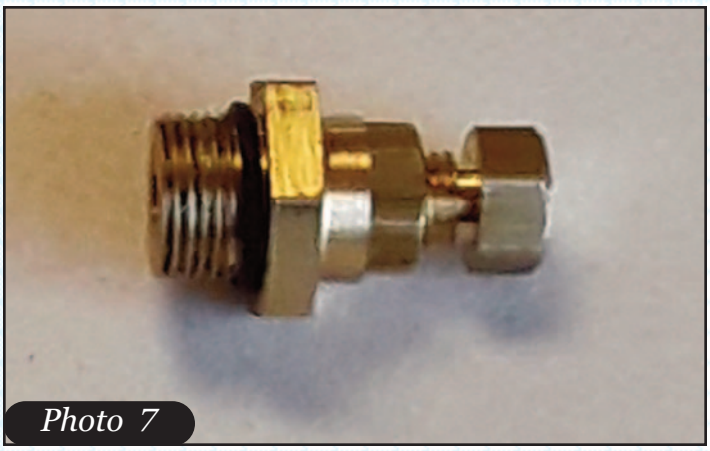


Photo 7

This valve gives a good range of adjustment, from around 15 PSI to 75 PSI. Since we often use the safety valve as the boiler fill plug on our locomotives, the jam nut prevents accidentally disturbing the pressure setting.

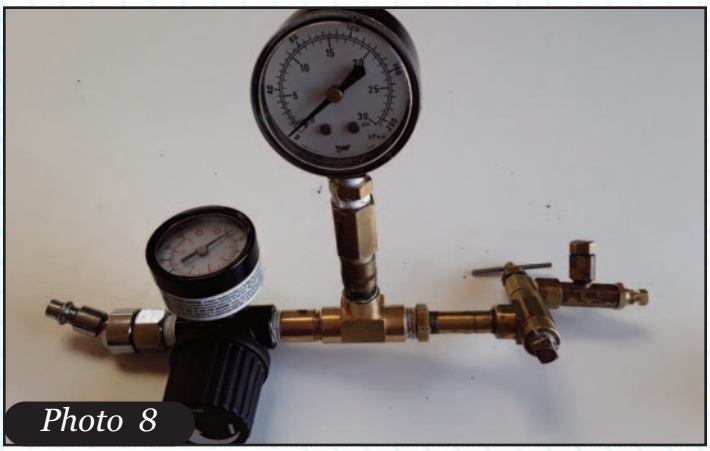


Photo 8

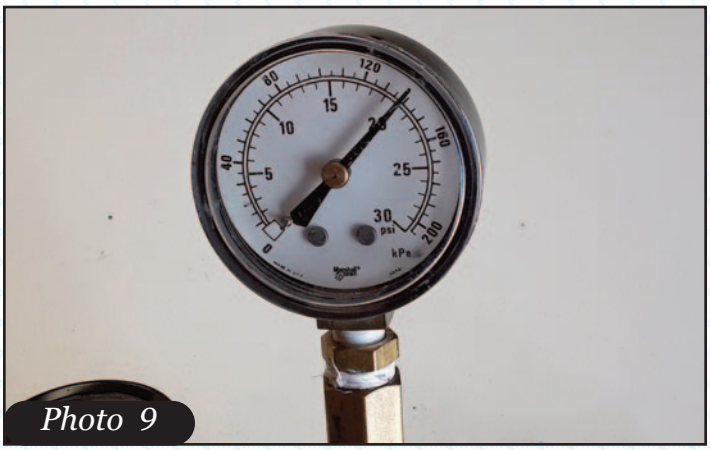
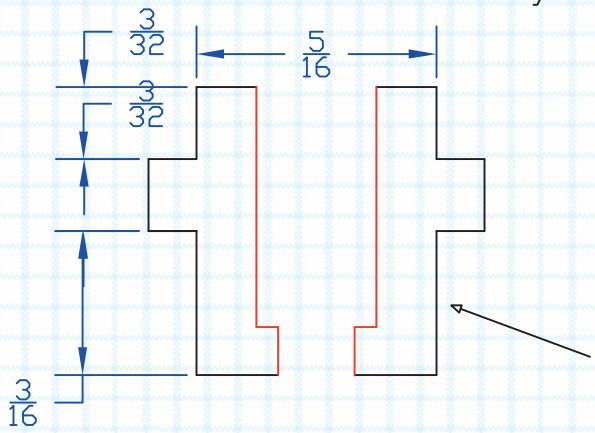


Photo 9

Small Safty Valve

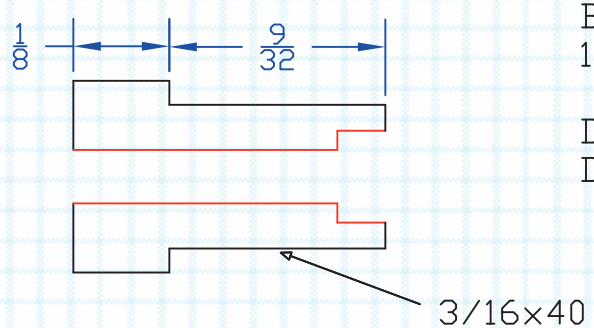


#1

Valve body
7/16″ hex brass

Drill #39 through
Drill 5/32″-9/32 deep
″D″-bit 5/16″ deep
Tap 3/16x40-1/4″ deep

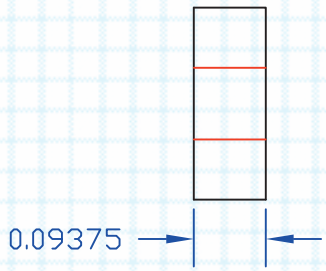
5/16x40



#2

Bonnet
1/4″ hex brass

Drill #31 1/16 deep
Drill #50 through



#3

Jam nut
1/4″ hex brass

Tap 3/16x40 through

Commercial Parts
Spring .250 long
.120 □D
.088 ID
.016 wire dia.

McMastercarr
part #9435K11

Ball 1/8″
Stainless steel

McMastercarr
part # 9642K29

Dan Pantages
June 2019

THE CUPOLA VIEW

How Was Your Summer of 2019?

As I write this issue's editorial, the official end of summer holiday is gearing up and we finally moved out of the intense East Coast summer heat/humidity combination into some cooler days. Summer 2019 was very busy for us. We enjoyed the National Summer Steamup in Sacramento, California complete with a couple of railfan trips along the way. Summer also brought celebrations at a couple of steam clubs that in addition to the Grand Scale trains, (ride-on) have incorporated or updated their Gauge One tracks. This is a growing addition to the small scale live steam hobby as many older Grand Scale live steamers move down to smaller trains that are easier for them to handle. The upside of this is the inverse interest generated in a younger generation who want to get a start in the small scale and work their way up in size while they are young and healthy enough to manage the larger scales. I was able to gently cudgel a couple of articles for future issues on both the National Summer Steamup 2019 and new Gauge One tracks at larger scale clubs, so look for those in upcoming issues. Some of you may have some summer activities that you could write about.

We've also received some correspondence from around the globe on steamup activities which are also in the fire-tubes for future issues. I love to get these as it shows that our subscriber footprint is growing due to the digital version. We have always tried to bring in articles from around the world as we know that our subscriber base has a keen interest on not just U.S. prototypes, but locomotives from all over.

Cheers, and Happy Steaming — *Scott*

'Cupola view' is written by Editor Scott E. McDonald: you can contact him at sitgeditor@gmail.com or P.O. Box 1539, Lorton, VA 22199.

TIMETABLE

Special or Annual Meets

Cabin Fever Model Engineering Show January 17-19, 2020 - Lebanon Valley Expo Center & Fairgrounds, Lebanon, PA. Gauge One Tracks available for steaming. Visit *www.cabinfeverexpo.com* for more information.

International Small Scale Steam Steamup. January 20-26, 2020. 103 Live Oak Drive, Diamondhead, Mississippi. Visit *www.diamondhead.org* for more information.

Staver Locomotive Spring Steamup - April 23-26, 2020. Staver Locomotive, Portland, Oregon. Visit *www.staverlocomotive.com* for latest information.

Fourth Annual Gathering of North American Members of the Association of 16mm Narrow Gauge Modellers - May 2020. Hazlet, NJ.
Visit *www.northamerican16mmmodellers.org* for more information.

National Summer Steamup 2020 - July 8-12, 2020. McClellan Conference Center, McClellan, California. Visit *www.steam-events.org* for more information.

Regular steamups

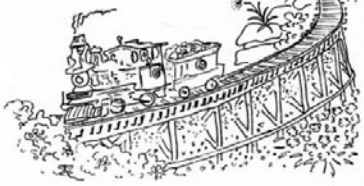
Crescent City High Iron. Steamups as necessary on an elevated backyard layout on Northern California's upper coast. Info: Don Cure, diamondd1947@msn.com.

Greater Baton Rouge Model Railroad Club Open House and Gauge One Steamup. Info: Ted Powell, (225) 236-2718 (cell), (225) 654-3615 (home), *powell876@hotmail.com*.

On the Brink Live Steamers. Wednesday, and occasional weekend, greater Sacramento, Calif., steamups on elevated live-steam tracks at two locations, as well as special events. Info: Paul Brink, (916) 935-1559, *paulbr@aol.com*.

Puget Sound Garden Railway Society. Two steamups per month, one at the Johnsons' on the second Saturday and a steamup at a member's track on the fourth Saturday.
Info: *http://psgrs.org/* or call Pete Comley at (253) 862-6748.

Southern California Steamers. Contact Jim Gabelich for dates, places and other pertinent information. (310) 373-3096. *jfgabelich@msn.com*



CONTRIBUTOR BIOS

The magazine couldn't exist if it were not for the dedicated individuals who take time from the hobby to chronicle their endeavors, interests, and joy of live steam. If you get a chance to meet any of our contributors at a steamup, please thank them for their contribution.

Bill Allen - Bill lives in Woodside, California and first became interested in live steam in 2008 when he saw Richard Murray's layout at a BAGRS open house. He proceeded to buy a Ruby, C16 and Forney before deciding to start building his own. He bought a mill and lathe and with the help of some BAGRS members learned to use them and was soon making chips. Since then he has completed 20 projects, some of which have been featured in Steam in the Garden, and currently has a multi part article running in Live Steam. All of his builds are one-of-a-kind, as he only builds those which have never been done before and probably will never be done again in G gauge live steam. Bill's prior hobby was building fine furniture and he uses some of those skills and tools in his engine building.

Jeff Campbell - Jeff Campbell was infected with the train bug at an extremely early age. Thanks to his father, Jeff's first bedroom held a crib, dresser, and a 4'X8" HO layout. Years later, at the local fair with his family, Jeff noticed a G scale layout in the garden exhibits and a fuse was lit. Under the guise of getting his young son a "Toy Train" for Christmas, Jeff's empire was launched. Jeff's interest in live steam began while riding on the tender of a 2-4-0 at Disneyland. All the valves, pipes, and gauges were so intriguing and within weeks a kit form Accucraft Ruby was running in the back yard which turned him into an avid live steamer.

Les Knoll - Les started his railroading experience with a Lionel F7 freight set at Christmas at age 6. This grew to a tabletop layout in the family basement, later to be supplanted by a theater pipe organ and a rock band practice space in his teens. Later in life the HO/HOn3 bug bit, and the first incarnations of his Rivendell & Midland Railroad, one of the first JRR Tolkien-based railroads in the US, took shape. The R & M moved outdoors with his discovery of live steam in the early 90's, and after two purchased locomotives, five scratchbuilt live steamers followed, ranging from a 14-ton Shay to a 2-4-4-2 logging Mallet. The current Rivendell & Midland is in the back yard of Les's and wife Ruth's lake home in North Carolina. Les is a retired Forensic Engineer and a Registered Professional Mechanical Engineer.

Patrick McConnell - Patrick grew up in the railroad history-rich area of Tuolumne County with notable companies such as Sierra Railway, Yosemite Short Line, Westside Lumber Co, Pickering Lumber Co, Hetch Hetchy Railroad, and several others. He spent his childhood not just playing with dad's vintage Lionel trains but riding behind Sierra Railway #3, the movie star locomotive, and walking along abandoned railroad grades. In 2009 Patrick graduated from the Lionel sets to garden railroading on the family's 200 sq ft railway. Patrick is a Senior at San Francisco State University studying Recreation, Parks & Tourism and works as an Outdoor Trips Leader. His other interest is restoring and driving classic cars. You can catch him at any given time driving around i his 1966 Volvo 122 Amazon Wagon to steamups and railway open houses.

Joe Rothwell - Joe started building models as far back as he can remember, mostly due to having an older brother. He would simply follow his brother's lead. Plastic kits gave way to balsa/tissue planes. U-control planes gave way to R/C planes. The family always had a train set; O scale at first (both wind-up and electric), then HO and ending with N scale. Joe now has a 4-foot x 6-foot table top N scale layout, running mostly NYC equipment. Steam interest was rather late — he purchased his first engine in 2006. Joe finds the hobby very satisfying and still looks forward to working on the various projects he has lined up. In real life Joe is a land surveyor in order to foot the bills.

***Your Name Can be on this Page!* -** The whole world is waiting to hear from you! We are always looking for Live Steamers to share their thoughts, experiences, projects, latest acquisition... The list goes on!

We need Locomotive Reviews, Tips & Hints, Steamup Reports, etc. All contributors are compensated for their submissions. Submitting is easy. Just e-mail your idea to sitgeditor@gmail.com and we'll work with you to bring your article to our pages. Visit www.steamup.com to view our Contributor Guidelines to see how easy it is to show the world your small scale live steam interests!

Advertiser Index

Coming Soon!
Issue #165
Jan/Feb 2020

Part 6 - Workshop Series by Les Knoll
Finishing the Freelance Heisler

Statement of ownership, management, and circulation

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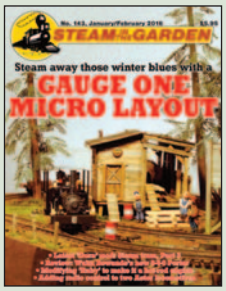

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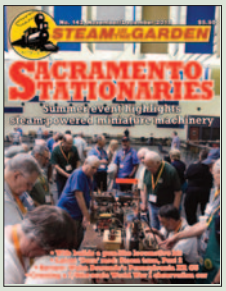

Vol. 25, No. 6; Issue 142; Nov/Dec 2015
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Vol. 25, No. 5; Issue 141; Sept./Oct. 2015
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Vol. 25, No. 2; Issue 138; March/April 2015
Laser Loco: Scratch building with laser-cut brass. Part 1 • How steamers in Seattle created a community • Getting an LED onto the front of Accucraft's C-19 • Two former ride-on live steamers decide to go to Gauge One • Romance, realism of coal firing: factors to consider before taking the plunge.

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Vol. 24, No. 6; Issue 136; November/December 2014
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Vol. 24, No. 5; Issue 135; Sept./Oct. 2014
A big little locomotive: Accucraft's 7/8ths-scale 'Fairymead' • Scratch-building the four-cylinder Heisler, Part Two • The backyard Rivendell & Midland Railroad, Part One • Build a train barn • Review: Regner's 'Otto' • Latest Waybill: Accucraft 1:32-scale rolling stock; end of boiler detection; new wheels..

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