

Standing Data NHRTI 8.30a
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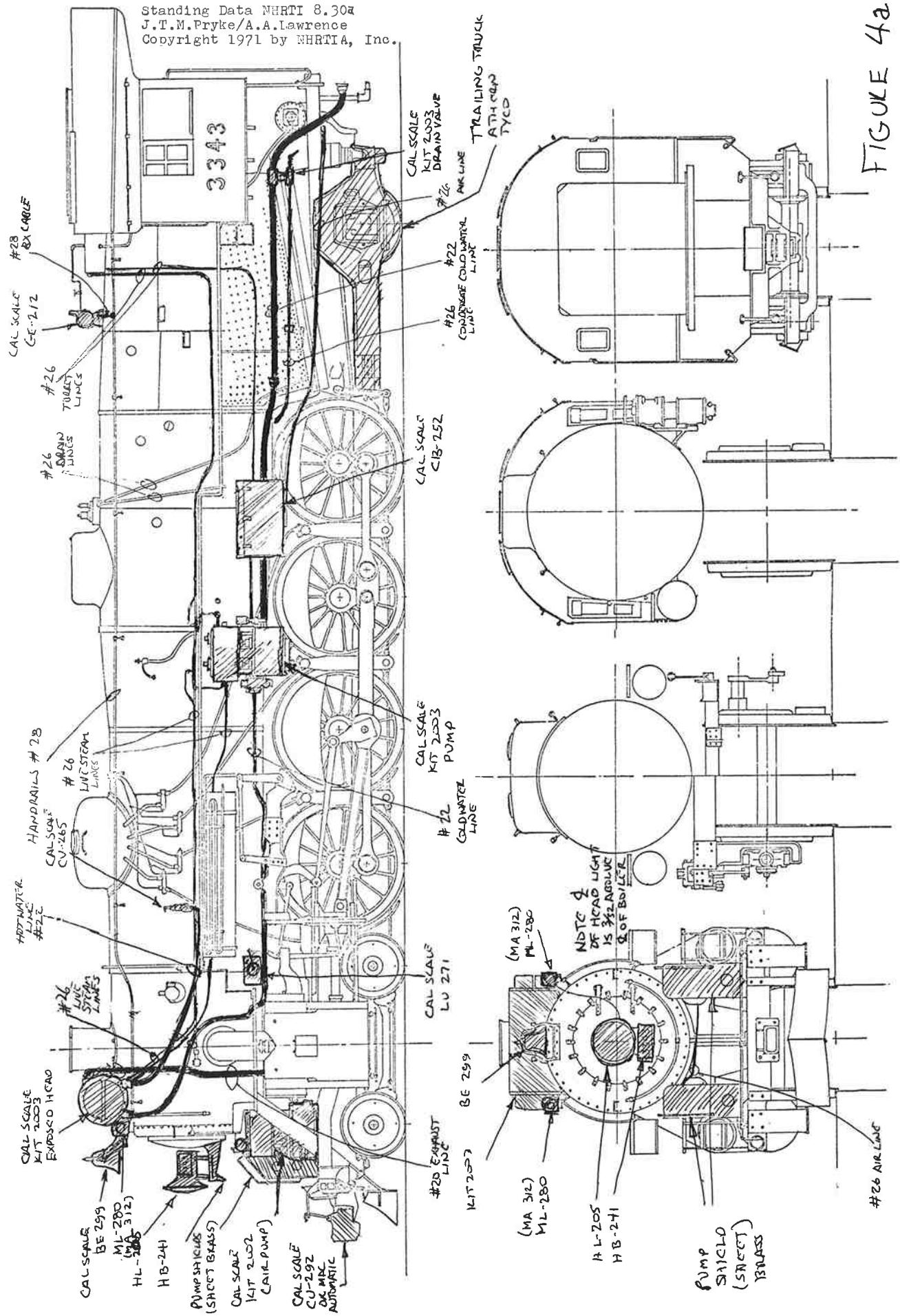


FIGURE 4a

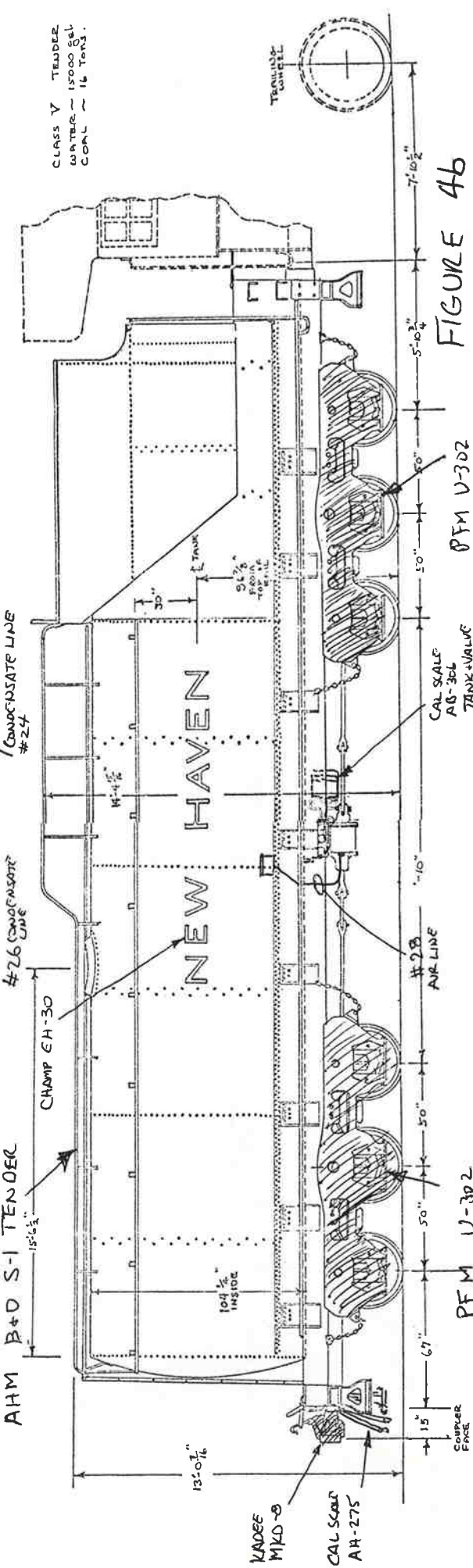
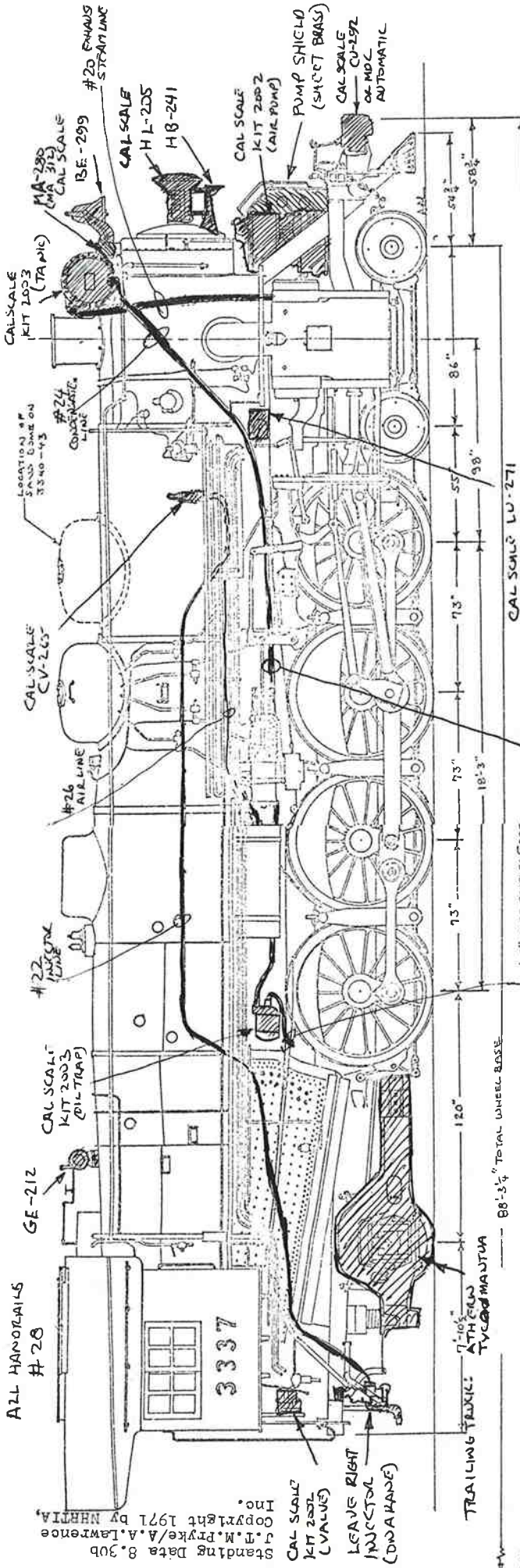


FIGURE 46

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CONSTRUCTING AN H-O NEW HAVEN CLASS R1b

Introduction

Of the various classes of 4-8-2s on the New Haven, the R1 represents both the most numerous and the easiest to model. Basically an USRA Light Mountain, and in fact 3300-3309 were the first 10 USRA locomotives delivered, the latter classes, R1a and R1b, were copies of the USRA design. After 3309 all remaining R1as were delivered with cast delta trailing trucks, elesco feedwater heaters, various different types injectors and southern valve gears. Most of these later R1as sported standard USRA short 8 wheel tenders, although a few were in later years equipped with 12 wheel square tanks. The R1bs, 3335-3343, differed principally in having the Baker valve gear, the large Class VI 12 wheel Vanderbilt tenders, assigned but not delivered with them, and twin air pumps mounted on the pilot deck.

From the modeler's standpoint, Class R1b is the most interesting since it does not require a southern valve gear, which must be scratch built or cannibalized from an USRA 2-10-2, and all conversion parts are commercially available. It is this locomotive, 3340 to be exact, with which this article deals.

1. BASIC MODEL

The ideal starting point for the R1b conversion is an Akane USRA Light Mountain. Although no longer commercially available, used locomotives can be picked up for \$60-\$70 through an ad placed in one of the trade magazines. Alternate starting points would be the Aristo USRA Mountain or the Bowser Mountain. In the former case, this is a cast zamac locomotive imported from Japan and requires considerable filing to remove detail before new details can be added. In addition, new details cannot be soldered into place and the modeler must rely on epoxy or Permabond to fasten all parts. (Ed's Note: Permabond and Epoxy properly used is equally as good as soldering).

The Bowser Mountain is really an USRA Heavy Mountain and its boiler is too fat for the R1b, however it is passable and can be used. Since the author's experience in conversions is entirely based on Akane units, this article will describe the conversion of the Akane USRA Light Mountain to a New Haven R1b, although the techniques are applicable to the Aristo and Bowser models.

2. LOCOMOTIVE RUNNING GEAR

The primary change required to the Akane running gear is in replacing the USRA trailing truck with a delta truck and rebuilding the lead truck for improved appearance.

2.1- Trailing Truck

The two best delta trailing trucks from a dimensional and appearance standpoint are the Athearn and the Tyco/Mantua trucks. The Athearn truck was manufactured for their B&M P4d Pacific and its availability is questionable. (Some of the larger hobby shops may have some left in stock). The Tyco truck is readily available, but has a roller bearing journal instead of a square journal. If the Athearn truck is used the booster cylinders must be cut off with a razor saw and a brass plate taken from the discarded USRA truck must be affixed to the front of the truck with epoxy for a new swivel. The old swivel hole must be beveled off to clear the Akane frame. (See Fig. 1a)

If the Tyco truck is used the round journal must be filed square, or filed off altogether and replaced with the face of a Kentron square journal epoxied into place. The existing swivel hole must be cut off and replaced with a new swivel. (See Fig. 1b) An easy way to make the new brass swivel is to remove the swivel from the Akane USRA trailing truck and epoxy it, or drill and tap for 00-90 screws, to the new truck as shown. The delta trailing truck may now be installed using the existing Akane mount.

DELTA TRAILING TRUCK

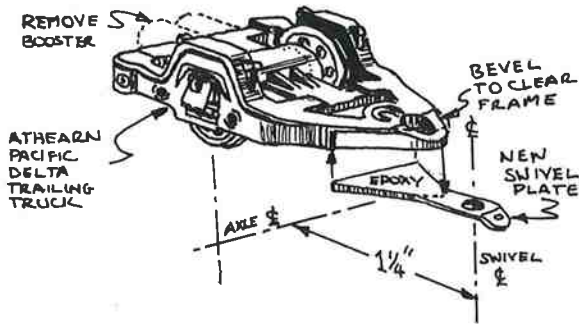


Figure 1a

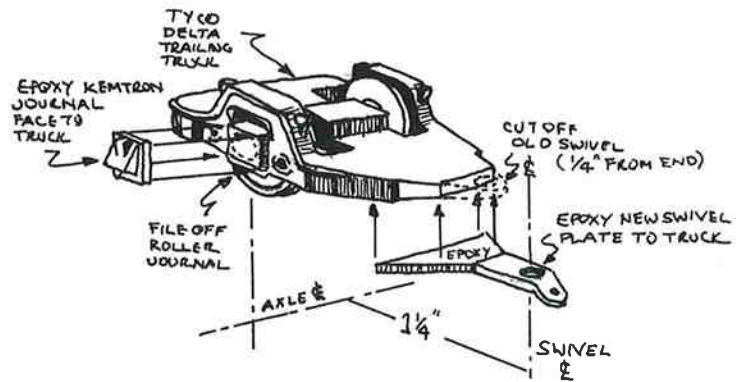
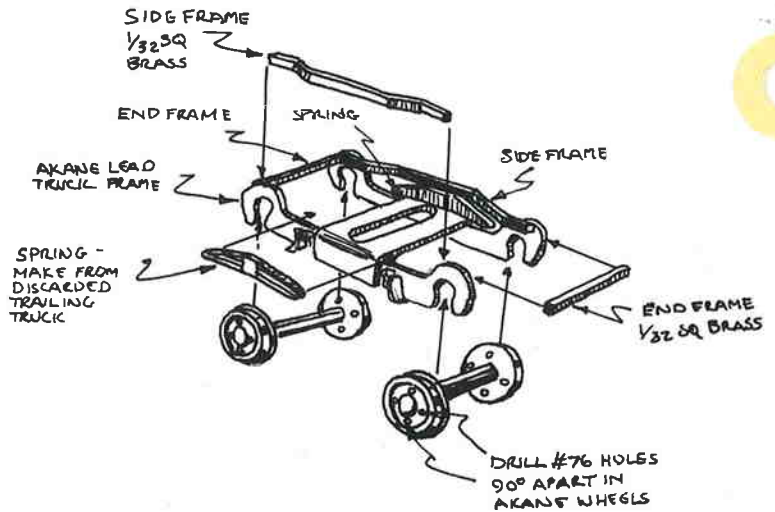


Figure 1b

2.2- Leading Truck

Although the Akane lead truck is dimensionally correct it lacks detail. This detail consists of a truck frame made from 1/32" square brass bar stock; leaf spring, made from the spring on the discarded Akane trailing truck filed to shape; and pilot wheel holes drilled with a #76 drill in the pilot wheels at 90° spacing. Figure 2 shows the new truck detail. The running gear is now complete.



3. SUPERSTRUCTURE

Strip all the varnish from the Akane superstructure using commercial laquer thinner and soaking the entire boiler and cab for at least one day. Next strip all piping off the boiler except the right side cooling coils, under the running board; the right side turret line; the right side injector and the left side cooling coils, under the forward running board. You are now ready to commence the rebuild.

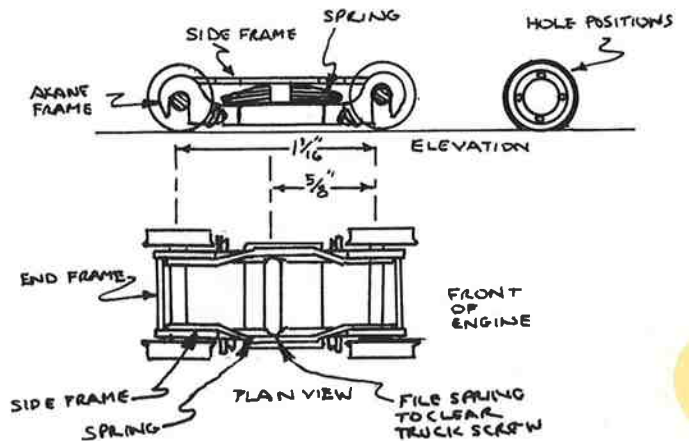


Figure 2

3.1- Smoke Box Front

Remove the smoke box front from the boiler and then remove the Akane headlight, which will be discarded. File two half-round notches in the smoke box front and elongate the centre headlight wire hole as shown in Figure 3 and 3a.

Take a Pyle headlight, Cal-Scale HL-205, file the angled number boards straight and mount on a Cal-Scale HB-241 bracket. Using a 00-90 die thread the bracket sprue and attach through the bottom of the elongated portion of the headlight wire hole securing with a 00-90 nut. (Note: If you don't have a die, the headlight bracket may be secured with quick-drying epoxy or Permabond.) The centreline of the installed headlight should be $3/32$ " above the centreline of the smoke box front. Bend the smoke box to conform to the smoke box front notches and to clear for the air pumps, and affix the smoke box front back on the boiler. See Figure 3a.

If you wish to discard the Akane bell this may be replaced with a Cal-Scale BE-299. Epoxy or solder on Cal-Scale marker lamps, MA-280 or MA-312, to the smoke box front as shown in Figure 3.

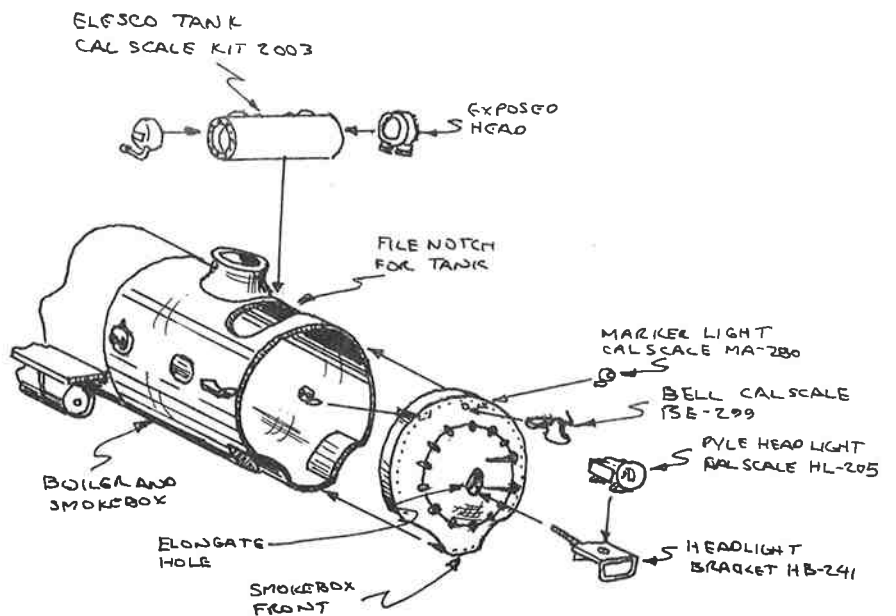


Figure 3a

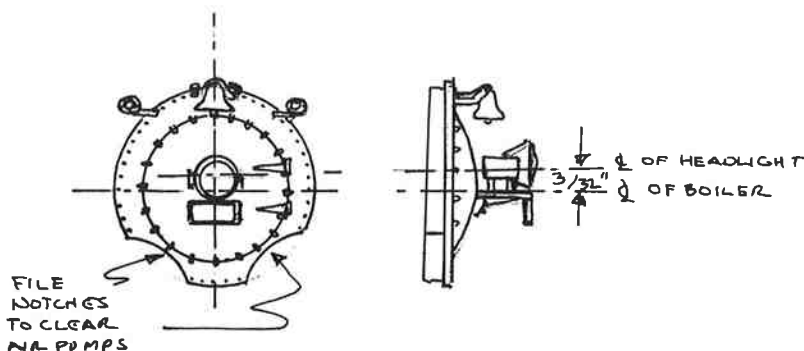


Figure 3

3.2- Air Tanks

Remove the left rear air tank and re-solder in place under the right rear running board 3/8" in front of the fire box throat. Re-pipe left front cooling coil into rear of left front tank. At this time remove the air pump from its left side mounting but leave the bracket in place.

3.3- Elesco Feedwater Heater System

Purchase a Cal-Scale Elesco Feedwater System, Kit 2003, and mount the pump on the existing air pump bracket. File a round slot 3/32" deep in the smoke box with the centre line of the slot 3/16" behind the front edge of the smoke box. Assemble the feedwater tank using the exposed head on the left side and epoxy or solder into the slot. See Figure 3. Build a sheet brass bracket and affix the oil trap immediately behind the right rear air tank. Remove the left injector and mount the drain valve on the left injector mounting bracket. Make sure it clears the trailing truck swing. Use the Cal-Scale Information Slip to check parts and pipe sizes.

Commence piping the system by installing the live steam pipes, #26 wire, from the feedwater pump to the tank, see Cal-Scale Information Slip and Figure 4a. Next install exhaust steam pipes, #20 wire, on both left and right sides, see Figures 4a and 4b. Use lagged piping on these lines if you have any scrap stock available. Now install Cal-Scale #CV-265 check valve on the left side of the boiler in front of the sand dome piping and run the hot water line, #22 wire, to the rear hole of the exposed tank head. Finally install the cold water line, #22 wire, from the front hole of the exposed head, under the left air tank and to the front port on the Feedwater pump, see Cal-Scale Info. Slip. Build a square "C" shaped piece of wire, #26, for the live steam ports, upper parts on pump, of the feedwater pump so that the ends of "C" hook to the pump and the back of the "C" protrudes above the top of the pump about 1/8". Solder the top live steam pipe from the tank in a "T" joint to this line and run a second line, #26 wire, from a second "T" joint, just behind the first, to the turret. (Note: To make room for this latter pipe remove the existing line from the turret to the left injector, itself already removed). Solder or epoxy all lines in place, see Figure 4a and Cal-Scale Info. Sheet.

Run the cold water line, #22 wire, from the top port of the drain valve along the left side of the fire box to the lower rear port of the Elesco pump. Run the condensate line, #26 wire, from the front bottom port of the drain valve, along the bottom left side of the fire box, past the ash pan, under the boiler at the left fire box throat plate. Now run the condensate line from under the boiler at the right side throat plate, use #26 wire, and under the oil trap curving in a "U" shape to the lower oil trap port. Be sure that neither condensate line protrudes into the space for the worm shaft. Finally, run a condensate line from the top port of the oil trap behind the right rear air tank, above the power reverse, behind the front right air tank and up to the smoke box to the bottom valve opening on the right Elesco tank head, see Figure 4b. This condensate line runs over the right exhaust steam line.

Replace the Akane check valve on the right side of the boiler with a Cal-Scale CV-265 and join it to existing injector line, see Figure 4b.

3.4- Air Lines

Run an air line, #26 wire, from the front of the right rear air tank to the rear of the right front air tank. From the front of the right front air tank run a single loop cooling coil, #26 wire, back to the rear of the right middle running board and then front to cut in under the running board above the top of the

smoke box, by the smoke box/boiler joint, and into the front port of the left air tank. Connect the existing two loop coil beside this tank to the rear of the tank and run the other end of the coil, also at the rear of the tank, under the boiler.

3.5- Miscellaneous Boiler Fittings

Mount the Automatic Train Control Box (ATC), Cal-Scale CB-252, under the left running board to the rear of the Elesco pump. Run a Bx line, #28 wire, from the generator under the whistle cord and solder to the left handrail. (If you are converting a Bowser or an Aristo Mountain, you will need a Cal-Scale GE-212 generator.) Make a blob of solder and file to look like a junction box. Mount two mechanical lubricators, Cal-Scale LU-271, on the rear of the cylinder block running boards on both right and left sides of the locomotive. Run a bell cord made from two individual strands of Grain-o-wheat wire twisted together from the cab to the bell. Anchor this bell rope to pipe brackets, Kentron X1415, mounted below the pop valves on the side of the sand dome, the front edge of the boiler where it joins the smoke box and the top of the Elesco tank, see Figure 4a. Mount an air distributor valve, part of Cal-Scale Kit #2002, under the right rear side of the cab. This completes the boiler.

4. PILOT DECK AND AIR PUMPS

The R1b locomotive had twin cross-compound air pumps mounted behind shields on the pilot deck. Commence this installation by cutting openings in the pilot deck with a jeweler's saw as shown in Figure 5. Next fabricate the pump shields from sheet brass as shown in Figure 5; use .010 brass. Solder or epoxy the completed pump shields to the pilot deck. Using a Cal-Scale Kit # 2002, cut the air filters off both air pumps and save for later use. Fit the pumps to the shields. This will require removing 1/32" from the bottom of both pumps so they will clear both the boiler and the leading truck. Affix the pumps to the shields using epoxy or Permabond. Mount the left air filter between the shields, left of centre, and epoxy in place. Run an air line, #28 wire, from the top of the right pump through the pump shield back under the smoke box and to the top rear port of the left pump. Run air hoses, Cal-Scale AH-320, across the pilot deck, right of centre, and under the coupler lift bar. Mount a scale coupler, Cal-Scale CU-292, or an old MDC coupler if you want it to work with the lift bar, in the coupler pocket. Drill, #58, and file a slot between the top of the pilot and the bottom of the pilot beam, see Figure 5. If you are ambitious you can replace the Akane pilot with Cal-Scale P-318, although the final effect is about the same as leaving the Akane pilot on. This completes the locomotive conversion; re-assemble and test.

5. TENDER

Purchase an AHM Vanderbilt tender, as used on their model of the B&O S1, 2-10-2. Although the coal bunker on this model is a trifle long, the additional length is hardly noticable. Replace the AHM trucks with PFM U-302 trucks which are closer to the New Haven trucks. Purchase a brake set, Cal-Scale AB-306, and mount the air tank on the left side of the tender, 2 3/8" from the front of the tender. The oil trap should face to the rear and the air line should be epoxied to the train line of the tender which runs above the tank. The AHM brake cylinder may be replaced with the Cal-Scale cylinder or may be retained. The Cal-Scale cylinder is too small. An air line, #28 wire, should be run from the reservoir, cast on to the right side of the tender, to the brake cylinder. If the AHM cylinder is retained, make brake levers from .015 styrene or from Cal-Scale AB-300 plastic "UC" brake set. Run brake rods as shown in the Cal-Scale

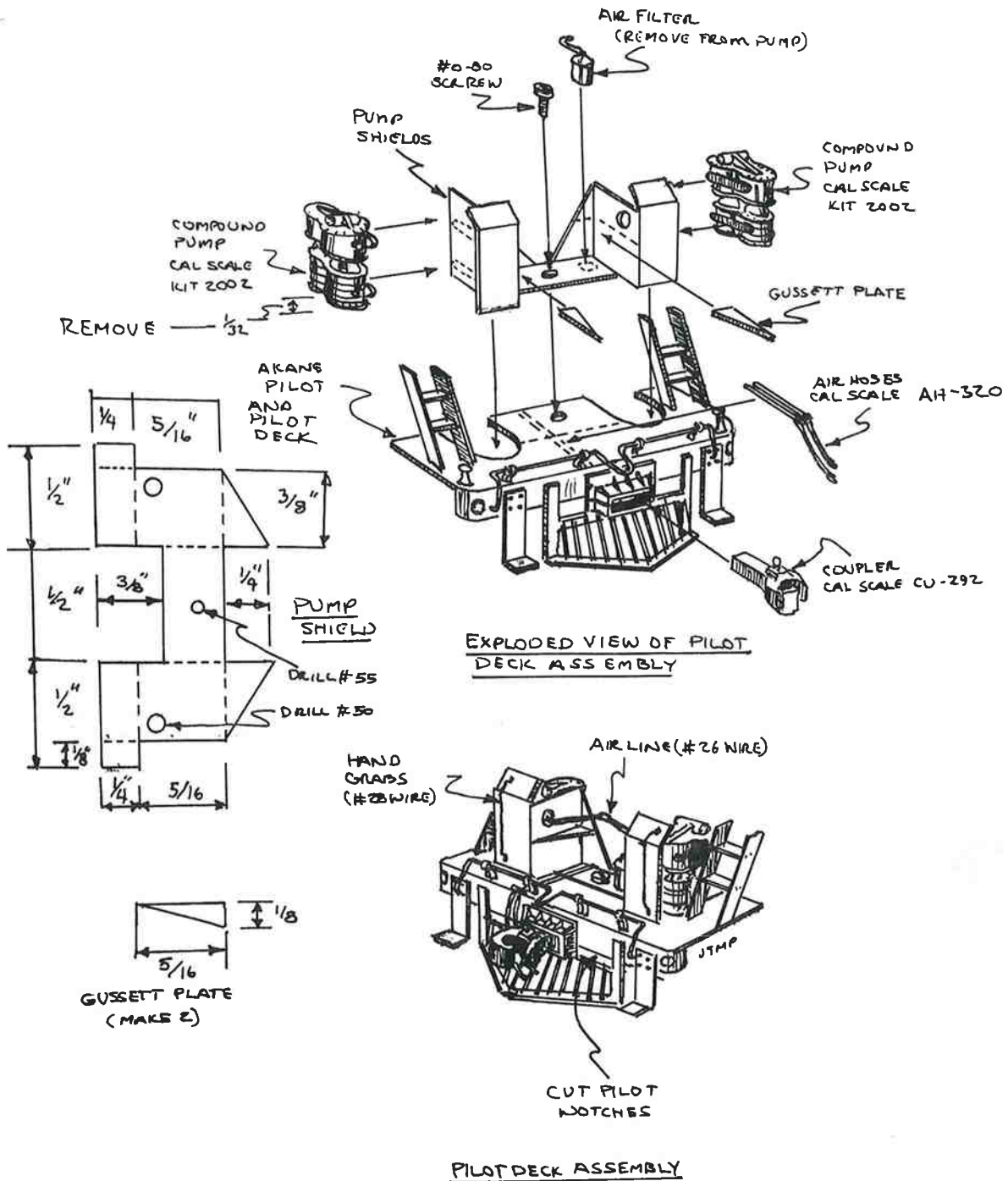


FIGURE 5

Information Sheet supplied with AB-306. Mount your favorite coupler, Kadee MKD8 for Kadee users, and install air and steam hoses, Cal-Scale AH-275 (plastic) or AH-274 (brass). Add coal and Scale Structures, Ltd. P224 Coal Rake and P238 Shovel for the final touch. The Locomotive and the tender are now ready for painting.

6. PAINTING

Figures 6 and 7 show the finished model. The model was painted with an air brush using Floquil Grimy Black as a base with a coating of Floquil Grime on the smoke box and fire box. (All paints referred to are Floquil). Drips from pop valves and fittings were sprayed through a "V" shaped stencil, first with primer and then with rust. Rust was added to check valves, tender hatch and pipe joints. The running gear was sprayed with Earth and then the whole locomotive was given a light coat of Grimy Black to tone down the weathering. The decals were Champ's set EH-30 used with Champ "Decal Set". Dullcote was applied over decals and then a light dusting of Grimy Black was used to cut down the bright yellow lettering. The inside of the headlight reflector and marker lights were painted with Testor's Chrome-Silver using a #00 Brush. Note that the feedwater heater pipes and handrails were over painted by hand with Grimy Black in the smoke box area. Figures 6 and 7 are photographs of the completed model numbered 3340.

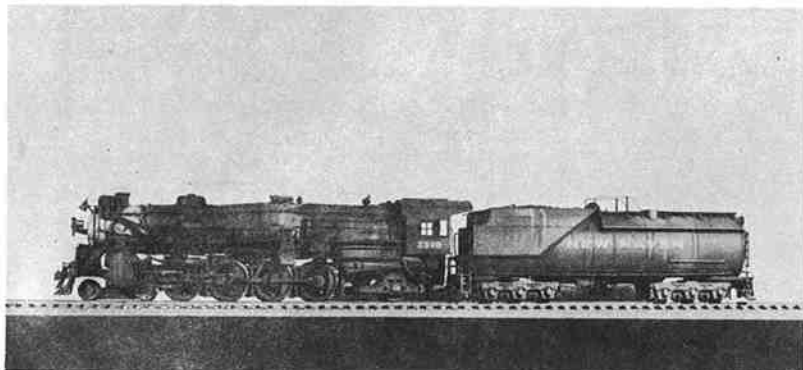


Figure 6

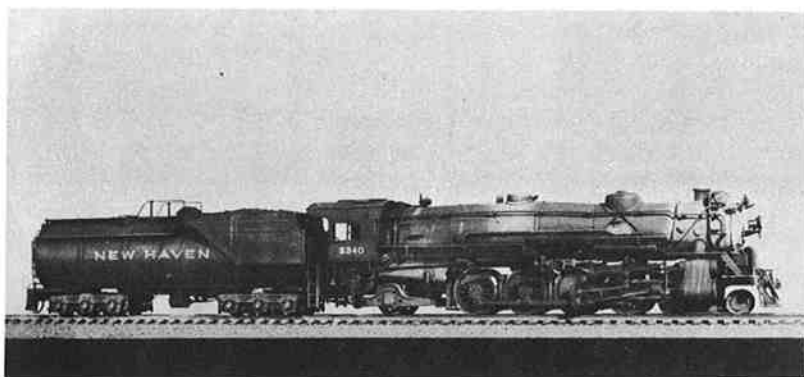


Figure 7

7. OTHER CONVERSIONS

The Author has also built a Rla from an Akane USRA Light Mountain using the same techniques. Photos of this model appear in Figures 8 and 9. The principle differences are:

- ATC Box on Pilot Deck.
- Air Pump on left side behind Elesco Pump. (Only 1 Air Pump).
- Headlight on centreline of boiler.
- Southern Valve Gear from Akane USRA 2-10-2.
- Covered Elesco Tank Head on Lft side.
- USRA Tender retained.
- No notches in smoke box front.

All other major details on the Rla are the same as the Rlb described in this article. The model was numbered 3312.

A R1, 3300-3309, would appear to be the same as the Rla except for the retention of the USRA leaf spring trailing truck and heaters added in later years, and were reclassified by the Mechanical Dept. as Rlas, and may have had air pumps moved to the pilot beam.

the Baker Valve Gear. See Figures 8 and 9. All Rls had the Elesco feedwater heaters added in later years, and were reclassified by the Mechanical Dept. as Rlas, and may have had air pumps moved to the pilot beam.

8. OTHER "R" CLASS MODELS

Although the author has not built an R2 or an R2a, he feels that a reasonably

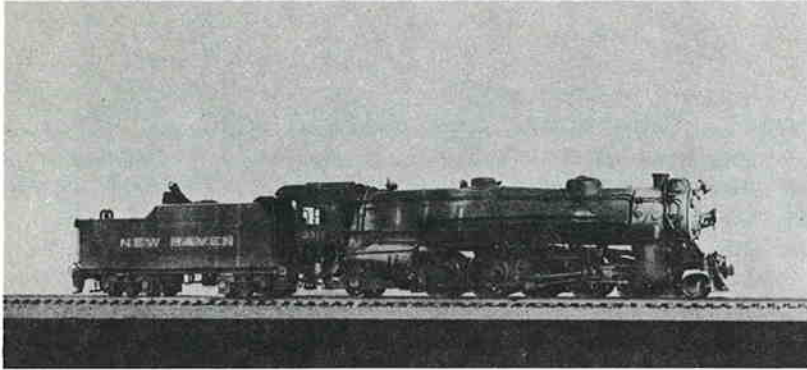


Figure 8

accurate model of these locomotives can be constructed from either an Akane USRA Heavy Mountain or a Bowser Mountain. The principle challenges in building this class locomotive are the split sand dome and the front-end throttle housing. A Kentron trailing truck can be used with some modifications. The tender must be scratch built, however, since there is no commercially made tender that fit Class W12a.

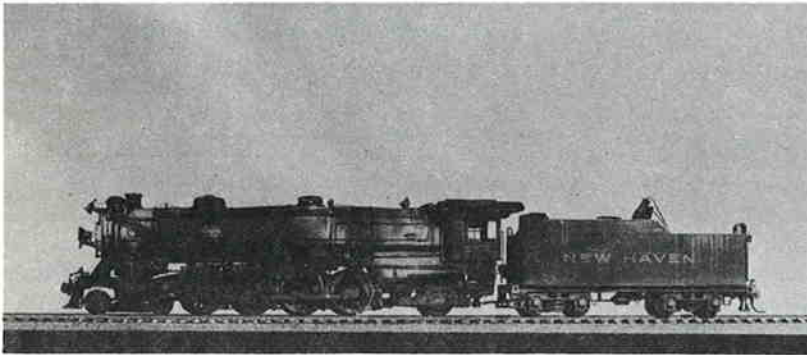


Figure 9

The Author has scratch built a Class R3a Mountain, called the New Haven type on our road, as noted in Model Railroader for August 1965. Plans for this locomotive may be found in the older Model Railroader Cyclopedia, Sixth Edition, by Kalmbach Publishing Company, 1950, at page 66. This volume has been out-of-print for a number of years but may be available at your local library or may be run across at

a used book store. However it is not recommended that you attempt to model this class locomotive since a true and accurate representation of the locomotive MUST be scratch built as no commercially available model matched its boiler profile or driver spacing, not to mention the problem of the third cylinder. As a result, the R3 and R3a are recommended for the very advanced builder only, although it is lots of fun to build, especially with a working third cylinder and gresley valve gear.

Publisher's Note: John's R3a model is truly a masterpiece and I hope that he will bring it for display at the annual Subscriber's gatherings. He spent in excess of 500 hours working on the construction of it and then, being dissatisfied with the quality, took it down and rebuilt it, using in excess of 800 hours on the rebuild. The article in Model Railroader shows exploded views of the Gresley Valve Gear and the working third cylinder system.

F I N I S