A couple of years ago, I found an article in the March 2013 issue of Railway Modeller magazine (published by Peco Publications in England) on how to build an HOn30 (or 009) “critter” using a Bachmann N-scale Plymouth MDT as a starting point. I liked the look of the final product and decided to build one myself. It came out fairly well; and ran well, thanks to the well-designed Bachmann mechanism. I was very pleased with the result.

Then it occurred to me that Bachmann also manufactures an HO version of this same MDT Plymouth. It seemed logical to assume that I could come up with an On30 version of this same critter. My Turtle Creek Railway could use another locomotive anyway, and so I purchased an HO version of the MDT locomotive and proceeded to build an On30 locomotive just like the HOn30 version.

In the process, I observed many differences in how I approached the construction; the amount of detail that could be added; and changes I could make to the basic design in O scale that weren’t easily done in HO scale. The following is a description of what I did, how I did it, and what I learned in the process of building two “creatures” – great and small, but maybe not so bright and beautiful!
The HOn30 Critter

The HOn30 locomotive is built over a 6-wheel N-scale MDT Plymouth diesel switcher made by Bachmann. Basically, the body shell is removed from the chassis; the cab is cut off of the shell; and a new cab is constructed of styrene and installed on the body shell.

The rest is details – e.g., adding handrails, headlight, exhaust stack, and so on. The photographs show the model in various stages of construction, and the final product.

Construction mostly followed the article instructions, with only a few alterations. I made the radiator grille a “venetian blind” type with horizontal slats. I also installed an intake air cleaner on top of the engine hood, and added an engineer.

The On30 Critter

basic construction

As mentioned in the introduction, it seemed plausible to build a similar critter in O-scale using an HO Bachmann MDT Plymouth switcher locomotive as the basis. Upon disassembling the HO Plymouth, I found that the cab is separate piece from the rest of the body shell, and was easily removable without having to saw anything off.

I proceeded to scale up the article’s dimensions for the cab components, to produce an O-scale version of the design. Here is where I made my first mistake. It seems that the HOn30 version is not really HO scale (1:87), but is OO scale (1:76). Therefore, the HOn30 version cab is actually too large by the ratio of 87/76, or 14%.

So when I scaled the OO dimensions by the ratio of 87/48, my larger model was also 14% too big. This was discovered after I had built and installed the cab, and had put the incomplete model on a piece of track to see how it looked coupled to another On30 locomotive. Of course the cab was significantly higher than the other locomotive. Lesson learned: double… no, triple-check your scale factor before scaling up a drawing!

In the end I decided to retain the larger cab. My rationale for pressing on: the Turtle Creek Railway engineer is a 6 ft 5 tall bruise, and he insisted on having the car shops install a larger cab so he could fit comfortably in it! “Keep calm and carry on…”

The cab was built in similar fashion to the HO version, with the side walls having inner and outer panels, so that a door opening and door could be incorporated. I used 0.040-inch thick styrene sheet for this cab, compared to 0.020-inch thick sheet used on the HOn30 version.
I decided that it would be a nice touch to frame all the window and door openings using 0.030-inch square styrene strip. I also added window mullions to some of the windows. Frame rails were made from styrene “I-beam” strip stock, and new end beams added from 0.040-inch thick styrene sheet.

**Variations from the HOn30 Critter design**

While building this model I did some research on various prototype critters, including studying a book called “Critters, Vol. 1” (compiled by James S. Eakin, Railhead Publications, Canton, Ohio, c.1998, USA). I thought that, even though this model was no particular prototype, it would be better if it had design features typical of actual prototypes.

The “Critters” book had photographs and catalog page reproductions of Plymouth narrow gauge critters. I found that the lightweight narrow gauge versions had outside frames, while heavier, more powerful narrow gauge versions had inside frames.

So I decided to convert the chassis to an inside frame version. I did this by cutting off the side frames of the frame and end beam assembly, and reinforcing the resulting assembly with styrene strips. Now I had a “bare naked” inside frame, which needed brake shoes to better simulate the prototypes.

I made brake shoes by slicing styrene tubing into thin rings (approximately 4 scale inches thick), and then cutting the rings into thirds. These were glued to a thin styrene backing plate, and this assembly was then glued to the inside frame between the wheels, using ACC adhesive. This turned out to be not too difficult to do in O scale, but would have been very difficult to do in HO!

Rather than remove the existing headlight and adding a larger headlight casting to the top of the hood - as was done on the...
HOn30 critter - I decided to keep the existing headlight. I made a larger shroud from styrene tubing, and blended it into the combined radiator and hood cover. This permitted an operating headlight, using the lamp assembly on the existing chassis.

The radiator itself was built up from strip and sheet styrene, similar to what was done on the HOn30 version. The radiator slats were made from strip styrene, glued to a backing plate that just fits inside the radiator shell.

I decided to add more detail to the hood by scraping off the door hinges and handles, and gluing new door panels over the existing ones. The doors were made from 0.020-inch thick styrene sheet material. I then added new (larger) hinges for each of the hood doors. Some hinges were made from 0.020-inch diameter styrene rod, and others were O-scale hinges made by Grandt Line.

I then used the Micromark louvre decals to apply louvres to the door panels and the top of the hood. This was the first time I had used decal louvres, and the effect turned out pretty well, although not as “distinct” as might be the case if the louvres were real. New door handles were made from 0.015-inch diameter phosphor-bronze wire. Hand rails were formed from 0.015-inch diameter phosphor-bronze wire. The handrails on the hood were held on using HO scale stanchions by Detail Associates. Grab irons were added to the rear wall of the cab. Hinges and handles were applied to the tool box cover on the back of the cab, which was also made from 0.020-inch thick styrene. New steps were fabricated from styrene and installed in each of the four corners of the chassis frame assembly.

From the photos of the model before paint was applied, it can be seen that just about the entire visible external body structure was scratchbuilt, except for the top of the hood. Louvre decals were applied to the top of the hood, and an air cleaner was fabricated from styrene tubing and attached to the top of the hood.

Completing the On30 model

The body shell was primed, and then given several coats of “Pullman Green” Floquil paint. The chassis frame assembly was painted flat black. The interior of the cab was picked out with primer gray. Once the body had dried, the window glazing was installed, held in by Microscale Krystal Clear adhesive.

Following this, additional roof support stringers were added. A roof covering was made from 0.020-inch thick styrene sheet and cemented in place, held down by rubber bands until the cement had thoroughly dried. The roof was then masked, and then primed and painted with flat aluminum.

Hand rails and grab irons were painted “Safety Yellow” using a brush; and the steps were also outlined in yellow. The end beams were painted flat red. Engine numbers were applied to both sides using dry transfers. Finally, a flat clear coat was applied.

An exhaust muffler and pipe were fabricated from styrene tubing and left-over styrene kit part sprues. This was painted flat aluminum, followed by applications of grime and rust. Uncoupling levers were fashioned from phosphor-bronze wire, and attached to the end beams with hand rail stanchions.

An engineer was glued to the top of the chassis after amputating his legs, poor fellow! He’s no longer 6 ft 5 tall. However, his HOn30 counterpart suffered significantly greater body loss in order to fit into the cab, compared to this On30 driver!

Finishing up included minor paint touch-ups, and weathering using a combination of dry brushing and thin black washes. The body was held on to the chassis frame by the coupler boxes, so there was no need to install hold-down screws. On the HOn30 version, the body just snapped into place.

Concluding remarks

All in all, this was an interesting project, and brought to my mind many interesting differences in modelling in HO scale versus O scale that I hadn’t expected at the outset - my oversights on correct scale factors being the most embarrassing!

One observation I made in tinkering with the HO MDT Plymouth mechanism was that the centre axle can be removed without disrupting the chassis operation, as it is just an idler axle not connected to the drive train gearing. This is not true of the N-scale version mechanism. This does suggest that the HO version can be used as a four-wheel drive mechanism for a future On30 motive power project. We shall see!