Building, Molding and Assembling Steps Shared

The original 1086 Precision wheel.

Hello again! Last time we talked, I was expressing my opinion toward the major manufacturers and parts suppliers about getting those detailed parts needed to customize toys at the detail level that the builders and collectors are wanting.

I went on and described how resin casting can be one alternative in producing our own parts, giving us that level of detail we should be expecting without purchasing a new-in-the-box item just for something as simple as a set of wheels or even being able to produce a completely new part that can take the hobby as a whole forward. So this month I promised you I would show you how I go about doing just that.

Now what I am going to show you is only a small piece of the puzzle to the whole idea. My idea was based on the real tractors which have a rim and a separate center hub on the rear wheels, meaning you could use a rim off of a John Deere and mount it on an Allis-Chalmers or International and vice versa.

But in the toy world, you get the parts that are offered and many times are unable to modify them or you have to purchase two or three different tractors to get the look you want.

So what I did was copy these real tractors. I cut the center out of a stock wheel, creating a rim or what I have been referring to as "a ring." I then added a step to this ring that I use to mount the cast center or what I call the insert. What makes this nice is that currently I produce an 18.4-38 tire and a 20.8-38 tire. If I was to produce an AC, IH or JD wheel separately, plus all of the different variations of those rims, I would have to build all of them twice because of the difference in tire/rim width. By producing the ring and then the insert, I have been able to produce them separately and give myself many more options without having to produce 20-40 different rims.

This also makes it nice in that you can also mount the insert into the rim from either side, offering both a deep offset and a shallow offset.

So I am going to show you from beginning to end how I build, mold and assemble an IH 12-hole insert, making a nice 20.8-38 wheel combo.

First, I needed a good donor

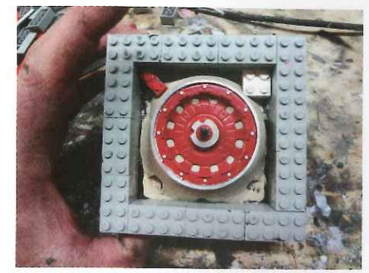
The tire has been removed from the rim and I have used a caliper to score a line around the rim as a guide for narrowing the rim on the band saw.

Here is the 1086 rim after I narrowed it with my band saw.

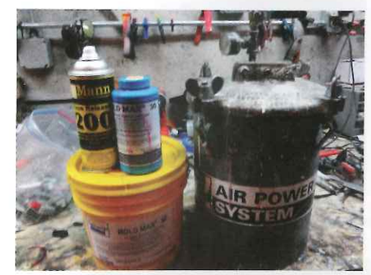
This is what I like to call my reverse lathe. I am spinning the center with my drill against my sanding wheel to help keep the center true and round.

Here is the center insert cut to size ready to be molded.

Finally, the insert is bedded in clay so I am able to create the first half, or bottom half of the mold.



Here I have Legos built around my insert as walls for the mold half. I also use the Legos as locators.



My arsenal of molding essentials includes Mold Max 30, Ease Release 200 and my pressure pot.

First half of the mold is completed and the clay is removed to ready the second half to be poured.

wheel. What I used is a wheel from a 1086 Precision. I felt this wheel offered the best detail of all the IH 12-hole rims and if you are going to replicate, you might as well replicate the best option available.

Once I acquired one of these wheels, I warmed the tire and popped it off the rim. Next, I grabbed my caliper and scored a line around the outside diameter that corresponded with the center section of the rim. I did this to give myself a baseline so I didn't cut too close to the center section, damaging it and ultimately wrecking it. With the score line on, I then took the rim to the band saw and carefully cut the extra rim material off, making sure I stayed outside of my score lines.

With the rim now narrowed down on width, the next step was to narrow the diameter so it would fit into the ring I was already producing. I did this by reinstalling the 1086 axle shaft into the rim. With the shaft installed, I used my cordless drill on the opposite end of the axle, spinning it against my disc sander and essentially creating a reverse lathe. Spinning the rim makes it a lot easier to keep round and centric.

So now I take the rim to my disc sander, spinning it with the drill and carefully starting to remove material from the edge, continually checking the diameter with my caliper until I reach an outside diameter of 2.250 inches which is where I have standardized my system at. Once I have reached this diameter, I use a file to deburr the diameter and give it a test fit into one of my rings for a final check.

Now that the insert pattern has been produced, it is time to make a mold of it. I start with a bag of Legos, some molder's clay and a small piece of plywood as a base. With the plywood cut about 2 inches wider than the insert, I use the molder's clay to create a mound for the insert to sit centered on the plywood. With this mound roughed, I then set the insert on top and press down, securing it to the clay as level as possible with the exposed side of the insert up.

You will want it up because we are creating the bottom half of the mold first and no matter how good we are, there will be air bubbles in the final molded product. By molding the insert or piece upside down, the bubbles should all be on the backside where they are less noticeable.

With the insert pressed into the clay, start to form a nice clean edge around the part, creating the parting line for the finished product. Keeping these lines as clean and straight as possible will make for an easier job preparing the product for assembly and paint later.

With the insert sitting nicely on the clay, smooth the clay around it as smooth as possible down to the outside edges of the plywood. Then use a knife to trim the edge of the clay, narrowing it so that Legos can be formed around the piece making the box to hold the molding compound.

Once this is done, create a wall of Legos two or three bricks high around the insert but no higher. Then lift the wall off the plywood and apply a nice layer of silicone to the plywood where the Legos were sitting and then reinstall the Legos back onto the plywood, creating a seal to stop the molding material from leaking out. Now that the Legos are mounted back in place, form the clay tight against the wall of Legos to hold everything in place. The next step is adding locating pins so that the mold halves can be reassembled time after time, creating good parts. Most of the time, I just use a screwdriver handle or pencil eraser but use two different styles.

Now that the mold structure has been created, I spray the entire pattern

Continued.

Here is my first IH 12-hole wheel insert.

Readying the insert to fit into the ring/rim.

and clay structure with parting spray, being generous but not too much. I then use the Legos to finish building the walls to a height 1 or 2 inches taller then the highest part of the mold. With the walls built, I wrap the walls tightly with masking tape to help create a tighter seal and then I add rubber bands vertically, holding them tight again to prevent loss of molding material. Give everything one last check—if all looks well, then let's pour it!

For molding products, I have been using Smooth-On products mainly because I have grown accustomed to those products. I am sure there are many other good products out there but I will give you my experience. I use the Mold Max 30 for my molding, it is mixed 10 to 1 and has a lot of stretch and forgiveness but has still been able to hold very good detail and have a long molding life, in excess of 100 runs.

I always pour a small amount of the molding material into my mold and vacuum it to help remove air bubbles. I continue with the small pours and vacuum until the mold is filled. Then I will use a pressure pot to help remove even more of the bubbles, creating the best possible mold I can. The Mold Max 30 has a 24-hour cure time so after pouring the first half, I wait a day.

After the 24-hour cure, I remove the mold from the pressure pot. With the mold removed, I then remove the plywood from the bottom of the mold and the first three or four layers of Legos. With the Legos removed, I gently start lifting the clay free from the mold and the pattern. Once the clay has been removed, I will then again spray the pattern and mold with the mold release, build the wall of Legos back up and pour the second half, just like the first, giving it 24 hours to cure.

With the second 24-hour cure complete, I again remove the mold from the pressure pot, but this time remove all of the Legos to save them for the next project. With the Legos removed, I find the parting line of the two mold halves and begin to gently pull them apart. Once the mold halves are apart, I lift the pattern from the mold, give the mold one last cleaning, spray with parting spray and put it to work!

Here again, the products you use to produce the parts are up to you, but I have been using 65D from Smooth-On and have found it to be one of the most forgiving resins I have experienced, with the same overall features as plastic. But whatever product you use, it will remain the same—spray the mold with mold release, pour the resin into the mold using a little extra and pouring some on both the bottom and top halves of the mold, putting them together, and installing the mold into the pressure pot until the resin has fully cured. Once fully cured, remove the mold from the pressure pot, pull the mold halves apart, remove the part and pour again.

We have the insert produced, now to put it to work. I already produce the ring, so I use some 80-grit sanding paper to clean the edges of the insert as well as the ring. Once the edges are cleaned up, I test fit and make any adjustments needed to the parts. With the insert fitting inside of the ring nicely, I will again use some 80-grit sanding paper to roughen the mating surfaces.

With the mating surfacing roughened and cleaned, I use a small amount of auto body filler as the glue between the two—first because it is cheap and second I have had good luck with it. With the auto body filler applied inside on the mating edge of the ring, I install the insert, making sure I keep them square and centered to each other. As the filler hardens, I use an X-Acto knife to clean up the excess filler that seeped out. When the filler has fully hardened, I use some fine sandpaper like 240 grit to clean up the details. Presto, one IH 12-hole rim ready for paint!

Once I got the rims painted and the tires installed, I was able to mount them on a nice 1468 Precision that I robbed the wheels off of earlier. Now this whole procedure can be altered many different ways based on the parts you want to produce. The main thing I am trying to focus on here is that WE can produce our own parts to our own liking, giving us the chance to customize a high-detailed tractor or implement to our own liking.

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To adhere the insert to the ring, I applied a small layer of auto body filler to the step in the ring.

Ready for paint. The new IH 12-hole center that was built using the 1086 rim is now becoming a 20.8-38 wheel for a 1468 Precision.

And finally the painted and installed 100-percent scratch-built wheel is installed on the tractor.