Down to Details

By Chuck Steffens

This month in the "Down to Details" segment of the *Toy Farmer,* I am going to try to fill a request for one of our fellow custom builders, Brian Long of Long Farm Toys. He called me one day and asked if I would build him a new tri-rib front tire to fit on the Precision 1456 front rim. Brian has done quite a bit of resin casting for me in the past and we have always worked out some type of "horse trade" so I figured this would give me a good chance to get ahead of him and one day I could get that favor returned.

The specific tire Brian asked for was based off the original four-rib front tire of the 1456. So first thing I did was to look one of those tires over close enough to get a good opinion if I wanted to tackle the project or not. Then it dawned on me that this may get me some more Long Farm Toys parts, so I guess that means I am building a tire.

To get started building this tire I grabbed a few used four-rib tires and gave them a good once-over, making sure there were no cuts, scrapes or imperfections. Once I found two good tires, I warmed them up using a heat gun until they were fairly warm to the touch so I could remove them from the rim. With the tire removed from the rim, I mixed up some auto body filler and filled the inside cavity of the tire so that it would be solid and would not flex during the modification that was going to be happening to this tire. Once I had the inside filled with filler, I used an X-Acto knife to remove some of the extra filler before it fully set up, but not taking too much so that another coat of the filler would have to be applied. After the filler had completely cured, I used 80-grit sandpaper to smooth the rest of the filler down until the diameter was smooth and even.

Original four-rib front tire.

Now that the inside of the tire is filled, the next task is to convert the four-rib tire to a tri-rib tire. At first Brian suggested just filling the center of the two middle ribs of the four-rib tire, making it a tri-rib, so I thought I would try that first. Before I was going to apply any filler to the outside of the tire I wanted to make sure it was clean and free of oils, so I used some wax and grease remover that is typically used to prep for paint. After wiping the tire clean I used the 80-grit sandpaper and scuffed the tire between the two center ribs to give the filler some bite. With the tire sanded I mixed up some more filler and very carefully applied it down the center of the tire making sure the center was filled 100 percent, but trying not to spatter the rest of the tire.

After the filler cured, I gently sanded the filler with the 80 grit, being careful not to work any one area too much and not scratch the tire anywhere it isn't supposed to be. It is very critical not to get carried away, but instead take your time because any imperfection or accidental scratch will show up later. With the filler carefully sanded, I took a good look at the tire and decided I didn't like it. It just looked like someone simply filled the gap between the center ribs of the four-rib tire—well, it is what I did! So instead, I decided to make the center rib about .050 taller, giving it a completely different look then the four-rib tire. So back to the filler.

First application of auto body filler.

First thing in doing this, is making sure that the two center ribs are scuffed all the way to the outside ridge with the 80 grit so that the filler will stick to the tire. After that I again mixed a small amount of filler and applied it to the tire as tall as I could without slopping the filler all over the rest of the tire. With some good luck I was able to do this. Now once the filler has cured, it is back to the 80 grit and sand, sand, sand—making sure to work the entire tire and not small areas. It also wouldn't hurt to have calipers to check your progress to make sure you keep the tire round. Here again, patience is a virtue. And rushing may only cause you more work.

Once the tire starts to take shape, it is very important to start checking the rib height with a calipers and then reapplying filler if needed. I had to reapply filler five times to get the shape I wanted without any pinholes. Now that the tire is the shape I want and is even and centric to the center, I used 600-grit sanding paper to smooth the filler even more. You want the tire to have as smooth of a finish as possible. Remember that any flaw in the tires will show up in the mold and when it is time to make a tire, every tire you produce will have that flaw in it. So take your time and do your best then check it again.

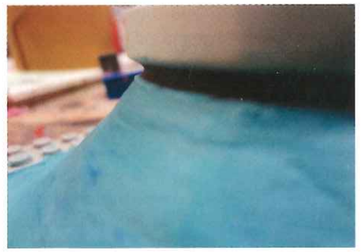
With the rib of the tire sanded smooth with 600 grit and looking topnotch giving it that taller center rib, the next task will be cleaning the extra filler that slopped on the tire while trying to create that rib. If you were careful with the 80 grit like I was, it is just a matter of using your fingernail and prying it off, because the filler doesn't like bonding to smooth surfaces. With the tire cleaned and built to your liking, it is now time to make the mold.

A second tire sanded with 80 grit on and between the two center ribs.

If you thought building the tire was a challenge, just wait for this. I did have some help making molds on the first two tires I built, but have since ventured out on my own and let me tell you, it can be an experience. Mainly because when building a tire there is no room for error like with many other forms of casting. Most casted parts can be repaired with filler or some good fill primer, but with a tire, that can't happen. What you take out of the mold is what you have.

I have learned from Brian and other mold makers that Legos can be your friend. What makes Legos so nice is you can buy them at a reasonable price, they have nice bases to start with and fit together solid. I did learn to just buy the two-by-four Legos because when you buy some of those Lego kits, you will end up with more pieces that you won't use than ones you will. With the two-by-four Legos and Lego base, I like to set the tire in the center of the base and then build a ring of Legos around the tire, staying a half-inch or so away from the tire. If you get any closer it takes strength away from the mold and if you go any wider it will just waste material.

Two tires ready for molding.



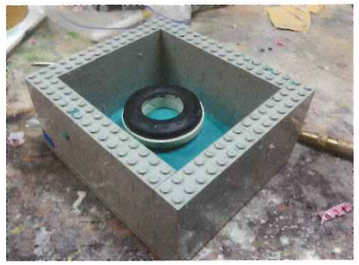
The tire having the clay up to the first rib creating the mold seam.

With the Legos one brick tall on the base and one-half inch away from the tire, the next step is adding the molding clay. This clay is very friendly to work with. It comes in many molding kits and is reusable from one project to another. With the clay filling the entire area inside of the one-brick-high Legos, start to build a tower in the middle of this area about half as high as the tire is round. In the center of this tall area place the tire and gently push it down into the clay, creating a bond between the two. Now make sure the tire is level on the clay tower and then start shaping the clay so that it is smooth all the way up to the first rib on the tire. I chose the first rib because it makes for a nice spot for a casting line later when molding the tire, leaving it as inconspicuous as possible. Here again, take your time and work the clay as many times as possible so you create a smooth transition. By doing this it will create a cavity later for holding the tire base product.

Lego base built and tire set on a clay mound.

Smooth-On, Mold Max 30 and Ease Release 200 for building the mold.

Once you have that clay shaped and smoothed out the way you want, it will be time to add some line-up marks. I use the backside of my center punch placing the marks on the corners so when the casting process begins these marks will help hold the mold in the proper position. I also like to mark the mold with my name using a center punch, this time to serve two purposes: one identify the mold as mine and second help make quick work of lining the mold halves up when the building process begins. You will also want to add some clay to the center of the tire moving the parting line to the halfway point on the rim. ⇨



Lego walls built around the tire.

First half poured.

Down to Details Continued

Now that the clay has been formed, the locating pins created and the mold has been autographed, the next step is to spray the tire and clay with mold release. I like to use Ease Release 200 by Smooth-On for my mold release spray. With the base half sprayed I then begin to build the walls around the tire with the Lego blocks, making sure I go plenty high giving myself plenty of space for molding material. Then use the Ease Release 200 again and spray the Legos I just added as extra protection.

With everything sprayed the next step is pouring a mold half. The product I use to do this is also a Smooth-On product, known as Mold Max 30. It is a two-part mix at 10:1 ratio that gets mixed in a separate container. I like to make sure I have enough product mixed up that there will be extra left over, trying to save a few dollars here can cost you later if you run short, so be sure to mix enough. With the Mold Max 30 mixed, use a vacuum chamber and degasify the molding material. Here is where it can be very beneficial to have mixed the molding material in an extra large container. When the product is degasified it will expand five to 10 times its original size before collapsing back down to its original size.

A three-gallon pressure pot I built using an old painter pot.

Completed molds.

Smooth-On, Vyta-Flex 60, SO-Strong black and Kick-it used for building the tire.

With the Mold Max 30 degasified I then proceed to pour the molding material into the pattern we just created. Pour the material out about a foot, foot and a half above the pattern creating a fine stream of the molding compound. This also helps in removing any air bubbles that may still exist. Once the mold half has been poured I place it into a pressure pot that I built using an old three-gallon painter's pot at 65 pounds. Here again, trying to avoid having any air bubbles in the mold.

After a 24-hour cure time on the mold half, I removed the pattern from the pressure pot. I flipped it upside down and removed the Lego base. Once the Lego base is removed, gently start removing the molding clay from the Legos and around the tire pattern—it will help to remove the first layer of Legos we started with. If you take your time it should come out in one piece. With the clay removed it is time for an inspection to check if it all looks well. You may have to remove some small pieces of clay and give it a final cleaning.

Now it is time to add Legos. It is best to add at least two rows of Legos to the bottom side that you just removed the clay from. Here again allow extra room for molding material. Then apply some Ease Release 200 for extra security and pour this side just the same as the first.

After another 24 hours in the pressure pot, remove the mold. Start by removing the Legos from around the mold. With the Legos gone carefully pry the two mold halves apart. If you applied the Ease Release spray properly, the mold halves should come right apart leaving you a mold ready for production.

I have found that when it comes to building a tire, the molds seem to have a curing process. The Smooth-On company recommends letting the molds sit outside for 24 hours in the hot sun or baking in the oven to help them cure. I have tried both of these and had little success. Instead what I have found works is simply running tires though the mold. You end up throwing the first 4, 6 or 8 tires away because of the curing process, but after that you will be producing a good tire. During this curing process the tire product doesn't fully cure and you will have to clean the molds after each run. I have found that aerosol brake cleaner cleans the molds up nicely.

The new tri rib installed on a Precision 6030.

On to production

To produce the tire, I use VytaFlex 60, another Smooth-On product. It is a two-part urethane rubber that mixes in a one-to-one ratio. I used Smooth-On's black tint called SO-Strong to tint the urethane rubber mix black to resemble a tire. One extra item I like to add to the mix is another Smooth-On product called Kick-it. This is added to part A of the urethane mix and it cuts the cure time by about a third, and from my experience it also produces a better stronger tire.

Using a mixing cup, add VytaFlex 60, SO-Strong black and Kick-it to make the mix. Unlike when I produced the mold, I do not degasify this mix mainly due to pot life of the mix. Instead I make sure it is mixed very well and again pour it from a foot to a foot and a half above the mold. Fill the main cavity of the mold until it is flush with the seam line and then add some to the opposite half of the mold making sure there is extra material in both mold halves. You have to remember you only have one shot at this and wasting a little material is minor compared to having a bad tire because you didn't have enough in the mold.

With the tire mix in the cavity and on the top half, put the two halves together using the line-up pins that were created into the molds. Then press the two halves together hard. If you did it right there will be extra tire material that comes out from between the mold halves. After I have the two halves assembled, pressed and extra material cleaned up, I place the mold into the pressure pot at 65 pounds for a minimum of 10 hours, but in most cases, 24 hours.

Letting the tire material cure, remove the molds from the pressure pot and open them up. If all went well you will have yourself a nice tire ready for installation. A lot of people may think this is a lot of work just to change a tire on your tractor from a four rib to a tri rib, but remember it is all about the detail—the little things that add up to Long Farm Toys now owing me one!

Thanks, Chucky. *TF*

Auction Report

The 27th Annual Toy Show & Toy Auction held Nov. 30, 2013, at Garner's Auction Center, Carrollton, Ohio, was an outstanding smash hit with toy collectors.

The show which opened at 9 a.m. with 60 display tables of toys for sale plus two tables with farm layouts was attended by 360 paid admissions at the door. The toy auction started at 3:30 p.m. featuring the Allis-Chalmers collection of Phil's Sales & Service of Columbiana, Ohio, with 405 lots. This auction had approximately 290 registered bidders in attendance plus bidders bidding live on www.garnerauctioneers.com from Utah, Montana, Nebraska, Missouri and Lititz, Pa. Buyers in attendance were from Toledo, Dayton, Xenia, Columbus and other areas of Ohio plus Parkersburg, W.V., Pennsylvania, New York and two came from Canada.

The following prices realized were:

A-C D-21 pedal tractor (only 10 made) $3,400
A-C one-row pull picker $1,400
A-C self-propelled combine $1,600
A-C flare box wagon $825
Gehl green chopper & wagon $1,250
(All of the above were custom made.)
Cockshutt pedal tractor $1,300
A-C D-17 pedal $1,350
1/8 scale Oliver 1855 ..... $600
Farmall 560 ..... $300
John Deere 70 ..... $400
Allis-Chalmers WD-45 ..... $420
1/8 scale JD 4010 ..... $400
1/8 scale JD disc $175
Oliver flare box wagon $200
Gleaner combines ..... from $190 to $630
1/16 scale toys were in demand as well.
A-C 7080 w/duals $135
A-C farm set w/deluxe barn $325
A-C pulling tractor $150
A-C 220 ..... $240
A-C pull rotary mower $100
A-C D-10 ..... $105
Oliver 1855 & 1955 ..... $95 each
A-C 180 ..... $65
Oliver Super 77 by Slik $130
Advance Rumely oil pull $140
Pedal cars also sold well:
1955 Chevrolet $400
Fire Chief $100
USAF Jeep $250
Good Humor pedal trike $190
U.S. Army airplane pedal $160
Police car $100

The auction was conducted by Larry Garner, Garner Auctioneers LLC of Carrollton, Ohio *TF*