

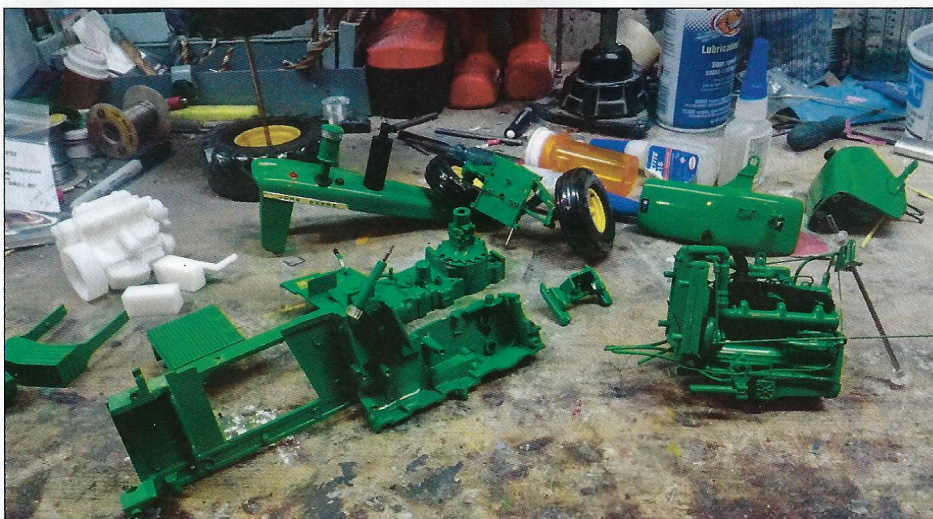
A new-in-the-box tractor and one of my 3-D printed Detroit 8-71 engines to start the project.

Modeling a Repowered **JOHN DEERE**, Part I

Welcome back to "Down to Details." This month, I am going to start walking you through a project modeling a classic "muscle tractor." These tractors from the 1960s through the 1980s and maybe into the 1990s really pushed horsepower and mechanical technology forward to match the demands larger farms were requiring.

One of these early muscle tractor icons was the John Deere 5010, which was designed with the John Deere two-cylinder mindset. Every component was built to handle three times the abuse that could ever be implemented, which the hit-and-miss two-cylinder tractors required to perform day-to-day chores without self-destructing. This gave John Deere its reputation for quality, long-lasting equipment.

With this mentality, John Deere set out to build its first 100-plus-horsepower two-wheel-drive tractor. Instead, the company built a tractor with a drivetrain so overbuilt it could handle way more power than the naturally aspirated 531-cubic-inch engine could provide. With 121 PTO and 109 drawbar horsepower and weighing nearly 13,000 pounds, it was so overbuilt and heavy that many complained the tractor barely had enough power to get out of its own way.



The disassembled tractor is ready for the transformation to begin.



The first trip to the bandsaw! Both of the side shields have been removed.

Deere addressed this problem slightly with the release of the 5020, coming in at 141 PTO and 121 drawbar horsepower. But the weight increased to about 20,000 pounds, so the tractor could still barely pull itself around, much less utilize its massively overbuilt chassis. Here is where two men, Ed Mead and Jon Kinzenbaw, stepped up and gave the 5020 the horsepower farmers wanted.

It's unknown if Mead or Kinzenbaw was the first to complete the repower, but Kinzenbaw, with his repowering department at Kinze Mfg., was better known for the repowering of the 5020s due to the large number of the repowers he provided. Both men repowered the nearly bulletproof 5020 chassis with a tried-and-true Detroit 8-71 two-stroke diesel engine rated at 318 horsepower, which fit into the wheelbase of the original tractor and really brought the 5020 to life.

As a kid, I remember our local monastery farming with three of these repowered 5020s. At the same time, my uncle was a mechanic for our local John Deere dealer. He talked about farmers pulling 30-foot discs with these tractors, but due to the extremely loud exhaust tone, they would shift the tractor back to reduce the noise level. That led to a lot of problems with sixth gear going bad on the tractors. One of these particular tractors was being repaired when my uncle measured its horsepower. He said it was at 350 horsepower when the PTO clutch started slipping and the tractor wasn't even beginning to work!

As an extreme fan of muscle tractors, particularly John Deeres, the idea of building a high-detailed model of this tractor just kept lingering in the back of my mind. About four years ago, I was trying to learn 3-D drawing and had recently purchased a 1/16 scale resin-cast 8-71 Detroit. The idea of the engine was there, but the quality and detail were poor. With this poor-quality engine and a pile of photos I found online, I was able to draw the components with much better detail and accuracy. With a little help from a friend to draw the supercharger, I had a satisfactory engine to install into a Precision Ertl 5020.

With the Detroit engine 3-D printed, I had lots of good intentions to install the engine into one of those Precision 5020s, but just never seemed to get around to it. I finally decided that I



Here is the replacement brass frame rail, drilled and ready for installation.

had avoided the project long enough. While installing the engine into the 5020 chassis, I managed to wreck a 5020 on my first attempt. In the process, I learned a few lessons.

I took this failed attempt to a few shows to spark interest in the engine, but I really needed to finish one for myself. During the past two years, I had been defeated in the custom built contest at the Gateway Mid-America Toy Show in St. Louis, Mo., by a good friend of mine. As the next show neared, there is nothing more inspiring to a man, causing him to spend umpteen hours and dollars, than a \$5 trophy and a friendly rivalry. Now was the time to get this tractor built and take back my crown!

That brings us here. With a new-in-the-box Ertl 5020 and one of my 3-D printed engines, I am going to try to learn the lessons from my first attempt in this 1/16 scale repower.

Doing my research into this repower and during my failed attempt, I learned that the frame rails for the 5020 were going to have to be replaced. On the original repowered tractors, the frame rails were replaced with 0.5x6 flat steel plates to give enough clearance for the engine to fit between them, so this was going to have to be one of my first projects on the list.

Wanting to save as many extra parts as possible without damaging them, I decided to tear down the 5020 to its bare frame before I did any major work to the tractor. If you have been following my column through the years, I have used the Precision 5020 a few times in the past and have written about the teardown, but I will give you a few highlights on the tractor again.

All-in-all, the Precision 5010/5020s are quite self-explanatory on how they come apart. If you see a screw, remove it. If you see a pin, remove it.

First, remove the steering wheel by simply pulling it straight off. Next, get between the gauge cluster on the dash and the dash base with a flat-tipped screwdriver and pop the dash free, exposing two screws to remove the hood. Two screws are located under the nose of the hood. With those removed, the nose and hood can be lifted off.

Next, remove the round cylindrical rock-shaft piston housing on the back of the tractor by gently prying it one way, then the other, until the glue releases and it is free. Use the screwdriver again and gently lift the rock-shaft shield from under the seat and pull it back, exposing more screws.

Once the rock-shaft housing shield is off, you want to remove the rear wheels. On some 5010/5020s, you can twist and pull the wheels free from the axle. On this particular 5020, it did not go as well. The solution to removing the rear wheels is to pop the black axle cap free from the wheel and drive the axle out of the rim using a long, thin punch.

You can then remove two screws under each battery box. There will then be two screws holding the rock-shaft. This will free the fender mount and removing the screws holding the fender to the axle will remove the fenders.

The next task is removing the pressed-in pins holding the 3-point arms to the 3-point saddle. To remove these, I use my side cutters to gently squeeze the head of the pin and slowly work it until it pulls free. The other two pins on each side, plus the screw holding the drawbar to the tractor, will also have to be removed.

Now, the drawbar, rock-shaft/seat assembly, battery boxes, fenders and rear wheels should be removed. Next on the list is removing the two screws holding the operator's platform. With these removed, pull back and up and that will be off. There are still two screws holding the steering shaft in place that will have to come out. With these two screws out, it should be a matter of locating the five screws holding the two frame castings together.

If you have been following my teardown, the five screws holding the two frame halves should be removed. Only the two screws under the front axle are holding the chassis together. With those removed, the frame should split in half, exposing more screws that hold the engine, steering stem and lower dash. That will all need to come out, giving you bare chassis halves and a whole lot of parts for you to keep organized.

The last step is removing the steps from the chassis. Carefully use a standard jaw vise-grip or pliers to pull them free and the modification can begin!

Like I stated earlier, the frame rails on the real conversion tractor are 0.5x6 flat plate steel, plus the real tractors never had engine side shields like the toy. So, to start the transformation, I take the two frame halves out to my bandsaw and cut the engine side shields off back to the firewall and down to the frame rails, but I do not cut the frame rails out just yet.

With the engine side shields removed, I then head to the bench again and match some 0.064x0.5 flat brass stock to the original frame of the tractor. Knowing that the chassis length was never modified on the real repowered tractors, I wanted to be careful not to change that on the scale representation of the tractor. My plan is to bolt the brass rail onto the existing rails, using four 0-80 bolts on both the rear and front of the tractor, ideally giving me a way of keeping the correct frame length.

Having each brass replacement side frame bolted front and back with four bolts each, I remove the bolts and take the frame halves back to the bandsaw and cut the frame out between the bell housing and the radiator. With this

section gone, I then use my grinder and file to thin the frame in these sections by 0.064, so the outside frame width would still be the same.

With the frame narrowed, I bolt the new brass rails back into the existing holes I drilled and tapped earlier. If all goes right when the two chassis halves are bolted back together, the hood will fit back onto the tractor perfectly. Luck is on my side and the hood fits just like it did with the original frame rails.

I think that is enough for this month! In future columns, I plan to take you through assembling the engine, modifying the hood to fit the air cleaners, installing double teardrop flattop fenders, installing row crop dust shields, swapping both the front and rear wheels, then final assembly.

As always, thanks for reading my columns. It still amazes me how many people come up to me at shows to tell me they read my columns and want me to continue! And, check out www.chuckysprecisionpullersandparts.com for parts used on project like these and past "Down to Details" columns.

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Both frame rails have been installed and the hood still fits correctly!

Living just northwest of Dyersville, Iowa, in the heart of farm country and farm toy replica country, Chuck Steffens has found a niche in the toy world, building high-detailed replicas in his spare time. He shares his experiences with Toy Farmer readers, hoping to lead other collectors to personalize one of their own tractors. Comments or suggestions can be directed to csteffens@wildblue.net.