Down to Details

By Chuck Steffens

This month in the "Down to Details" segment, I am going to be working on a project that I have been wanting to do for a long time. It is a project I really was expecting to see come from Ertl, but to this day I have not seen. This project is a 4020...gas! But it could be a 4000 or 4010 for that matter.

Now I did not grow up on, or was never really exposed to 4000 series gas tractors in my life, but I felt it is a nice twist on the more common diesel version. One of the first things I needed to do was a little research about the differences between the diesel and gas engines. I grew up around John Deere equipment and had a lifetime passion for the 4020s and then on top of that I had an uncle that spent over 20 years as a John Deere mechanic, therefore my research didn't take too long. What I learned is that the only real difference between the gas and diesel engines besides the obvious of the carburetor and distributor variations is the injection pump was internal. The head and block were basically the same with mainly cosmetic differences. So I guess we can say "Game on!"

To get the project started I had to find some parts. I am by no means talented enough to scratch build a carburetor or a distributor, but I bet I could adapt one from a different application. So I started by going though the "Chuckville Salvage Yard" and I found a Precision 3010 that had a rough prior life. The 3010 would share the same carburetor as the 4010 in the real world and be very close to the carburetor that was used on the 4020 so that gets me started. Now I search through some more parts looking for a good candidate for an intake manifold. While searching I took a look at a damaged Precision 4430 intake manifold and thought, "What if I turn it upside down?" So out comes my screwdriver and the 4430 intake manifold comes off.

I now think I have two vital components needed to build the gas engine. In a prior "DTD" article I installed a 4430 intake manifold on a 4000 farm stock puller so I knew it would fit but I would have to grind off where it tapered to meet the turbo. For this I grabbed my 2-inch angle die grinder and ground the angled turbo tube off of the manifold...okay, I think it will work. Next I had to get the carburetor off of the 3010. Like on the 4430 I got behind the intake manifold of the 3010 and pried it out freeing it from the engine. With the intake free from the engine I used a brand-new blade in my X-Acto knife and carefully cut the carburetor free from the intake. With the carburetor free from the intake I grabbed a little super glue and did a test fit and by golly I think this is going to work.

The 4020 I took on a "horse trade."

Instrument cluster/dash removed exposing two screws.

The screw that holds the front of the hood on.

Now that I am feeling confident in the project I just happened to do a "horse trade" the weekend prior where I took a No. 3 John Deere 4020 in on trade. I figure this would make the perfect candidate for this project. Those No. 3 Precision 4020s are quite common and aren't worth a lot but are still nice tractors. With my tractor picked it was time to tear the tractor apart.

To start the 4020 teardown the first thing that is needed is the handy heat gun. With the heat gun I warm the dash area and the surrounding hood area until they are warm to the touch, but not hot. Once the area is heated I use a small flat-tipped screwdriver and get between the upper dash/instrument cluster section of the dash and gently pry out. While prying out you will want to be careful not to tear the gauge decal. If it starts to hang up while removing the dash use an X-Acto knife to gently cut it free from the hood. With the upper dash off there are going to be two screws holding the back of the hood and the lower section of the dash on. Remove these two screws then grab the hydraulic levers and the shifting lever and lift the lower dash section off of the tractor being careful not to lose the pins holding the levers in place on the dash. With the back of the hood free turn the tractor over and between the front tires there will be one more screw that will have to be removed. Take this screw out and lift the hood off of the tractor. Now the engine is out where we can work on it.

Now that we can get to the engine, the first thing I want to check is the intake/carburetor combo I just built. To do this the intake will have to come off of the 4020's engine. Here again a flat-tipped screwdriver comes in handy. Get behind the intake and pry out. With the diesel intake free from the tractor I test fitted my new gas intake combo and here again it looks like this may work. Although with this test fit I am realizing I need to make some modifications to my combo. First modification is that I am going to have to make the intake thinner. So I use my 2-inch angle die grinder and remove material from the what is now top of the intake manifold thinning it to what looks like the right thickness. Next I use the grinder to roughen the rest of the intake to prepare it for some auto body filler.

After the intake is roughened up I then proceed to add the, what I think is called the heat exchanger, on top of the manifold. First thing I did when building these was to use two short pieces of brass square tubing and solder them together then I soldered these two tubes to a piece of brass flat stock. With the soldering complete I then glued it to the top of the intake manifold and used my grinder to clean and roughen it up for body filler.

On the 4020 gas intakes there is a large square plenum. To get this look I applied a quick coat of body filler and rough carve it out with my X-Acto knife. I then apply a second coat that I sanded to shape using 80 grit paper. After the shape I wanted was acquired I then used 240 grit to smooth the surface and prepare it for molding.

Now that the intake is built I use some glue and reinstalled the carburetor to the bottom of the intake and make another test fit. Okay, the intake looks good, but when I test fit the hood it hit the inside of the side shield. I had this same problem on the 4000 pullers I built so I am going to fix it the same way. I used my 2-inch angle die grinder and ground the inside of the side shield smooth giving me the clearance I needed.

I now need to build the intake tube that goes from the air cleaner into the carburetor. I was thinking I was going to need to make a trip to my local hobby shop for some styrene tubing but got looking though the salvage yard again and came back to the 4430 engine I robbed the intake off of earlier. On this engine there is a plastic tube that goes from the air cleaner to the turbo that looks the right size. After removing it from the engine I used my heat gun to warm it up and attempted to bend it and to my surprise it bent quite nice. So I proceeded to bend the intake tube to the angles I wanted then used my grinder to trim the length until it was a proper fit. After the tube was fitting right I used a little glue and glued it to the carburetor. I believe the intake side of the tractor is ready to be molded.

On to the distributor side of the engine. On this side the gas engine is a lot simpler then the diesel. The fuel filters and oil cooler need to come off. Here again use a flat screwdriver and pry out. With the cooler and filters removed there are a few holes to fill. For this I use my Dremel to roughen the inside of the holes and apply a small amount of epoxy in each of the holes.

With the distributor side of the engine cleaned up and holes filled the next step is building the distributor itself. Here again I made a trip through the salvage yard and found a few distributors, one off of a 460 would be a six cylinder, but it didn't have the shape and detail I liked. I then found one on a Farmall 400 that had nice shape, but was only a four cylinder. Here I made the odd choice and went with the 400's distributor because of the detail hoping no

Hood removed from the 4020.

Scrap 4430 engine that became the donor for the intake manifold.

Right-hand side of the 4020 engine with the oil cooler and fuel filters removed.

The 4430 manifold modified to start to look like a 4020 gas intake.

3010 donor tractor.

The heat exchangers mounted to the top of the intake.

The 3010 carburetor and intake removed.

Here is the intake with auto body putty applied to create the intake plenum and carburetor glued on.

Down to Details Continued

Carburetor feed tube glued on.

Distributor roughed out.

Distributor and intake built, ready to be molded.

Parts set in clay to make a mold half.

Molded parts ready to be painted.

Distributor installed and plug wires ran.

one's going to notice it is four cylinder. After my distributor was picked I needed a way of properly mounting it. Here I found an injection pump off of a 3020 Precision looked the part. So I cut the bottom off of the 400's distributor and the top off of the 3020's injection pump and glued the two together—not too bad. So test fitting and trimming and I believe it is ready for molding.

With everything test fitting great I then proceeded to mold up the pieces saving myself all this headache for a second, third or 50th 4020 gas I may build. After I had my first molded set casted I cleaned up the parts and applied some green paint as well as some black to the distributor. I also masked the engine block up and used my airbrush to paint the sides of the block that didn't have paint and where the holes had to be filled. With the parts painted I applied some epoxy to the backside of the intake, on each end of the intake and on the top of the carburetor feed tube and installed it to the tractor. I used some of the same epoxy to mount the distributor to the opposite side of the engine. With both sides mounted, next was spark plug wires. For these I found some fine black wire off of eBay that would fit the build. Using a .052 drill bit, I drilled six holes into the head of the engine where the spark plugs would be located. Then I inserted the wire into the holes with a small amount of epoxy on the end of each. After these were installed I cut the wires to length and epoxied the opposite ends of the wire to the distributor.

Getting close now, all that remains is to reassemble the hood and dash to the tractor. One extra thing I did though was I removed the muffler from the 4020 hood and replaced it with the muffler from the 3010 just to give it a nicer look and then I removed those tiny rear wheels and replaced them with a set of 18.4-34s.

Final task is at hand. We have to remove the diesel from the side panels of the hood. What I have found works good for this is non-acetone fingernail polish remover. I first mask off the 4020 then applied a small dab of remover to a paper towel and gently rub the diesel off of the hood making sure not to get too aggressive and damage the green paint underneath.

This project proves that with a little imagination along with a little determination a task that I personally thought I would never see can come true. I will say though I would hate to imagine how many hours I spent planning this project, coming up with ideas and trashing them only to come up with more. But in the end it came down to just building it.

Thanks, Chucky.

TF

Finished tractor.