Working with the SierraWest 3D Printed Duat Forklift

by Brett Gallant

Please handle these parts very carefully! While I use a high strength tooling resin that is very flexible and strong, these parts contain incredibly fine detail that must be handled carefully to prevent damage. Before you begin construction be sure to download: *"Working with SierraWest 3D Printed Castings".* These instructions cover all of the basics and provide essential information you will require before preceding. Please note: The HO Scale version of this kit is supplied with the wheels and steering column/wheel printed with the main body. Ignore the assembly instructions for these components. There is a wealth of information Online about the history of the Forklift and the companies that pioneered this amazing machine.

General Notes

Ninety plus percent of the 3D printed supports have been removed for you. A few remnants remain that need to be removed now, prior to priming. Look for small "bumps" along the bottom of the parts especially. Use a #11 blade or a small file to remove these bumps. In most cases these will not be visible on the completed model.

Prepare and prime all of the 3D Printed parts as outlined in the *"Working with SierraWest 3D Printed Castings"* download. Be sure to prime the styrene rod (steering wheel column) at this time as well. Leave the chain in its baggie for now.

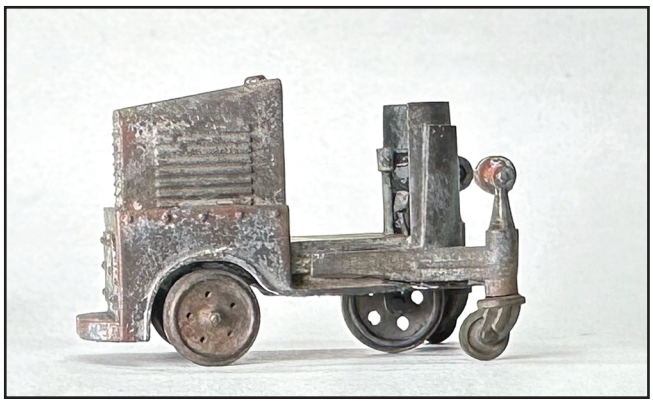
Allow the primer to fully cure before proceeding. I primed all of the parts in this kit with a quality flat black spray paint. Except for this black primer, all paint used is AK Interactive 3rd Generation water based paint. (Unless otherwise noted).

Paint and Weather the Components

I chose to paint my forklift classic machine grey with red/rust highlights. I have included photographs of the bottles of the paint color(s) I used on that assembly. These colors were applied over the cured, flat black primer.

The main body and tower are painted grey then chipped using the technique described in the Online video "Creating Peeling and Chipped Paint Effects" posted at my "University" link. A cosmetic wedge sponge is used to randomly pull paint off exposing the black primer underneath. Allow to dry. Next take a second wedge and with just a *tiny amount* of paint on it, blot the red/rust over the exposed black areas. Repeat as desired. Do not overthink this! It is better to have less of the red paint applied per application than too much. Keep the coverage random. Chalk weathering applied later will bring it all together.

Paint the five wheels in the same manner adding a little brown into the original application with the grey to represent dirt. I used very little red on the wheels.



Chalk weather all of the components once the paint has fully dried. I use several shades of brown's grey's, rusts, and a little black. A soft brush is used to apply the chalk to a small area then a very stiff bristled brush with short bristles is used to gently work the chalk over the body and into all the crevices. Use care when rubbing the chalk in as too much pressure may break fragile parts. A light hand is all that is required. Use the chalk colors randomly and with little thought except for the black. Apply the black at the end using it highlight details. Do not overdo the black.

Install the Wheels

Check the fit of the wheels prior to gluing them in place. There may be a very small supports inside the bore of the rear wheels. This is easy to remove with a small twist of the tip of your blade. The axle on the single large front/center wheel may be too wide to fit. Do not force it. Lightly file both ends of the axle until it fits without force. Make sure the top of the pair of front casters are filed smooth as well as the bottom of the main body where they are glued to for a clean fit.

Use CA and glue the wheels in place carefully so all five are flat on the workbench. Start with the two rear wheels then once they are secure glue the two front caters in place. Now finish with the single large front/center wheel. This is the wheel most prone to not being flat on the workbench so take your time to insure a correct fit.

The Center Chain Lift

Remove the chain from its baggie and blacken. Check the "University" link on my web for up to date information on the chemical blackening agent I am currently using. Be sure to thoroughly rinse the chemical off the chain and allow to dry.

The chain layout is visually appealing but not prototypically accurate. I decided before even beginning work on the forklift that the limiting factor would be the chain drive. Attempting to offer a commercial model with the prototypical chain arrangement was unnecessarily complicated so I simplified it. I am quite pleased with the final results.

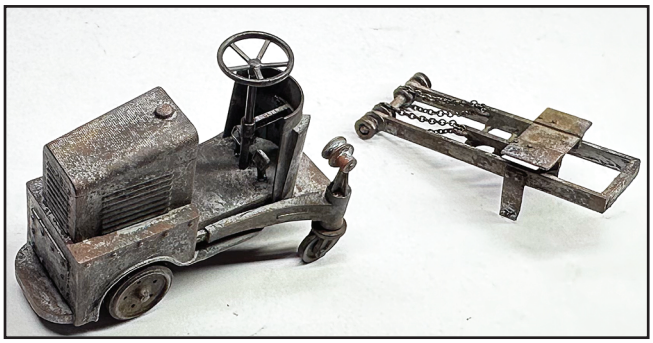
The general technique for adding the chain is to hide the ends under the bottom pulley or for the center chain, the ring. You want to make sure you do not overlap the chain or an unrealistic bump will be visible. Use a gel CA and take your time allowing the CA to form a solid bond before moving on to the next step.

Place a drop of gel CA under one of the rings then tuck the end of the chain under the ring in contact with the CA. Allow to set. The time this will take varies greatly depending upon the brand of glue, temperature, humidity, etc... You will have to experiment a bit to determine the correct time to wait. Once set, place a drop of CA at the top of the corresponding pulley directly above. Now carefully wrap the chain around and allow this to set. Next bring the chain down, cut it to length, then add another drop under the ring and join the ends. Do not cut the chain too short or try to pull it taught. A little slack looks fine. Repeat for the other center chain lift.

Before the tower is glued to the main body, it is easiest to install the steering wheel.

Install the Steering Column and Wheel

Cut the styrene rod to about 1/2" long then test the fit in the column collar and steering wheel. No adjustment should be necessary. Once satisfied with the fit, CA the wheel on first and ensure it is not crooked. Once the CA has set, CA the column inside the collar.



Epoxy the Tower to the Body

Check the fit of the tower and body. Once you see the way they fit together (study the photographs) epoxy them together. Allow the epoxy to set.

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The Outside Chain Lift

The outside chain lift has multiple layers which creates the appearance of a prototypical lift apparatus. It is very easy to add, just follow the diagrams and descriptions. The numbers correspond to the pulleys, the lines and arrows the chain. Unlike the Center Chain lift that was a simple loop, the outside lift wraps around in a distinct pattern. You can see in the diagrams, and will be directed in the text, to work on the front or rear of the tower. This is important to achieve the proper appearance. Several of the diagrams have accompanying photographs. These are labeled with the same diagram letter as well.

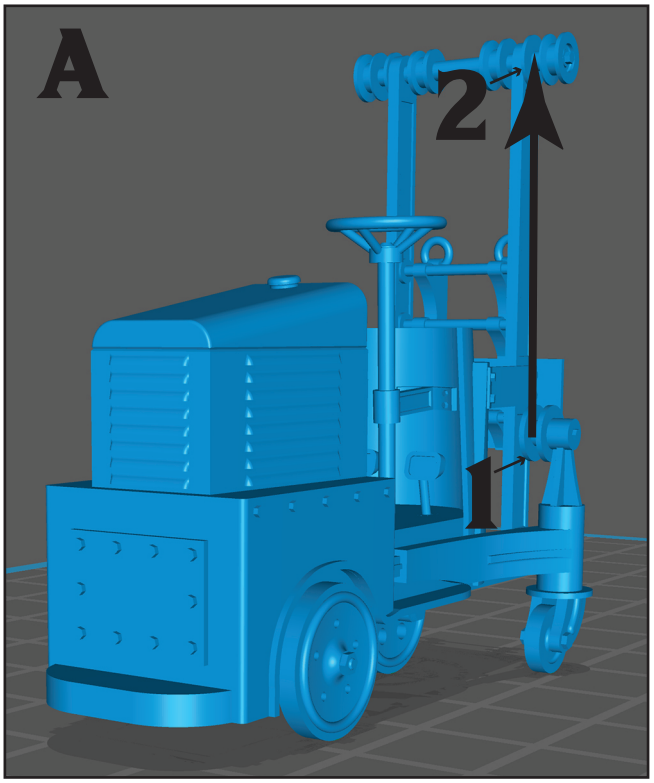
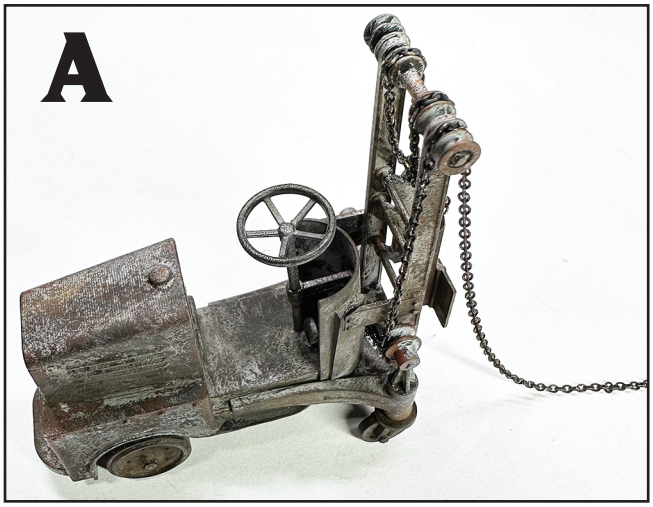


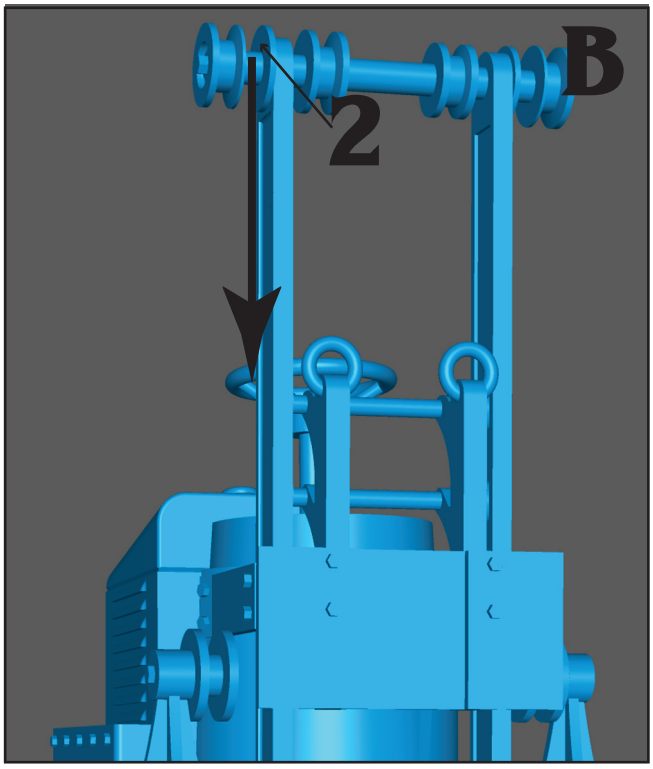
Diagram "A"

Start as before with a drop of gel CA placed under pulley 1 then attach the chain. You can see in diagram A we are working at the rear of the tower. Allow to set then bring the chain up the rear of the tower and with a drop of CA secure the chain to the top of pulley 2. Allow to set.



Diagrams "B" and "C"

Bring the chain down the front of the tower to about the same height as the pair of rings (used to secure the center chain lift earlier) then bring the chain up the backside of the tower creating a loop. Add a drop of CA to the top of pulley 3 (diagram "C") and secure the chain thus securing the loop. Allow to set.



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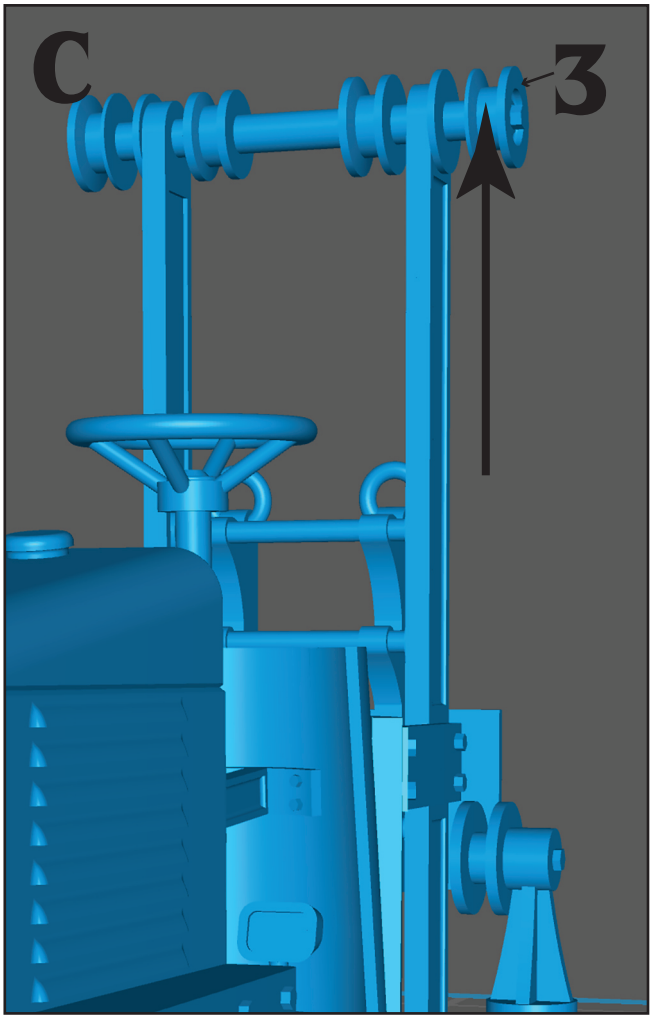
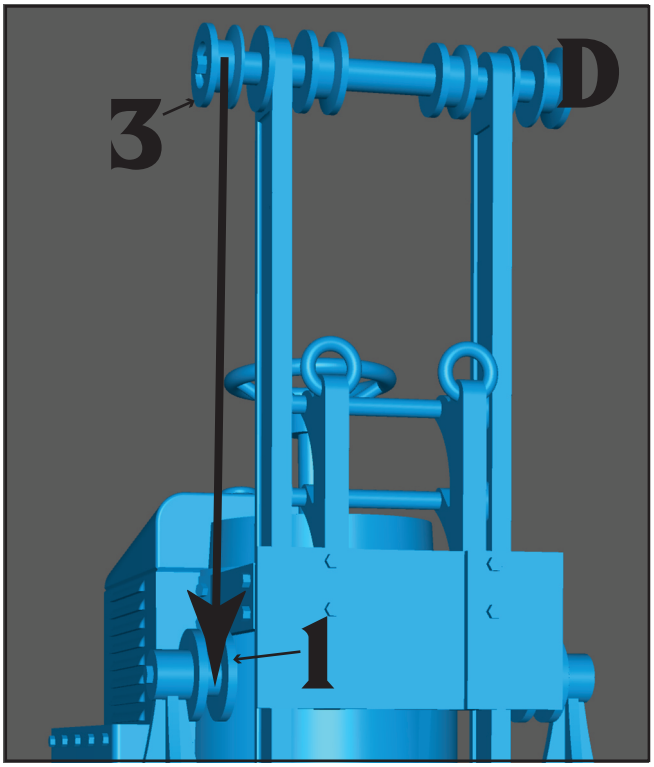
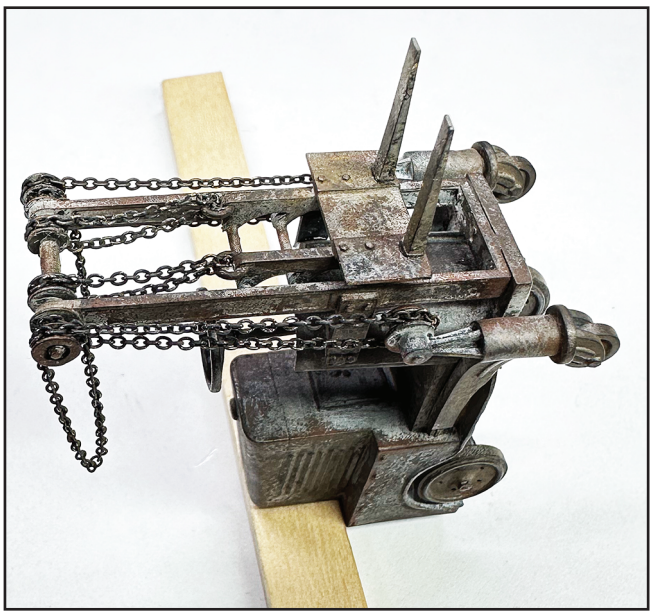


Diagram "D"

Complete the outside chain as shown in diagram D. Bring the chain down to pulley 1, cut it to length, then add another drop under the pulley to join the ends. Allow to set then repeat for the other side.



Add the Forks



Prop the forklift on its back as shown then CA the forks in place as shown. Allow to set.

CHAIN MAST DRIVE

FORKLIFT

CLARK-DUAT * LEXINGTON KENTUCKY