Building and Detailing Military Vehicles

Military vehicles have various levels of detail on their chassis, motors, and crew compartments, and adding small scratchbuilt details can really enhance their appearance. One of the vehicles I chose to build for this book is Heller's 1/35 scale Opel Blitz Type S truck. It has a nicely detailed chassis and a full engine plus a radiator. The engine detail is not complete, and there is no detail inside the engine compartment or firewall, but with bits of Evergreen plastic rod and strip, a few parts from your spare parts bin, and some wire from Detail Master, you can make the engine compartment the centerpiece of the model.

I used two reference books to help scratchbuild the interior parts, and I noticed that the engine wiring in the photos seemed to be a lot thicker than normal. To simulate this, I used Detail Masters 1/24 scale engine wiring for the spark plugs and the other wiring. The distributor was also missing on the engine, so I used Evergreen rod stock to simulate the stem and the distributor. I chose a slightly larger-diameter rod for the distributor so I could drill out the six spark plug wire holes plus the wire that goes to the ignition coil. I also added fuel lines, carb links, and battery wiring, as well as the wiring coming from the backs of the dashboard dials.

The kit's radiator was nicely done, but the filler tube was in the wrong place, so I made a new one. The intake and return hoses for the radiator were not included, but it was easy to scratchbuild them. I used small-diameter brass wire for the radiator pipe filler as well as the intake and return hoses. Your Waldron punch tool comes in handy here for making disks for the back side of the dashboard dials, the oil dipstick tube and cap, and radiator cap. I simulated the dashboard dials with decals and scraped off the molded-on gas, clutch, and brake pedals and fashioned new ones with scraps of Evergreen strip and rod.

Building up this model is also a good example of how you have to plan your work and deviate from the instructions. Cutting out the driver's door and the left front hood so the engine area would be exposed was not difficult, but assembling the cab with these parts cut out was a bit tedious. I had to position the parts, tape them in place, and make several adjustments before I could glue the cab sections. I also had to glue the cab together in such a way as to leave enough room to work in these areas prior to final assembly. Thinking it through and working out the assembly before I did any gluing made for a very successful experience.

The other kit I built up was a Verlinden armored vehicle resin kit. Resin kits can be easy to build because all the parts are usually cast as complete pieces. While there are no seams or cast lines to take care of, you will have casting blocks to remove and resin casting imperfections to repair. Good resin manufacturers don't have a lot of imperfections, but occasionally you get a bubble void. Sometimes you can get lots of bubble voids in places you won't see once the vehicle is assembled. When this happens it is usually an unavoidable result of the casting process.

Resin tips. Working with resin is easy as long as you follow a few simple guidelines. First, be very careful when removing resin pour plugs from parts. Resin is easy to cut and sand, so don't overdo it. I recommend cutting the plugs down to as small an area as possible using a razor saw, then sanding off the remaining resin. The excess resin on parts can be easily sanded off by running the part across a stationary piece of sandpaper in a figure-eight motion. Rotate the part so you don't sand off too much from one side. Take your time and check your work frequently. Once you have removed the excess resin, scrub the parts with a soft toothbrush and mild soap and warm water to remove mold release agents and resin dust.

Wear a dust mask when sanding resin—the resin dust particles should not be inhaled. One way to reduce dust is to always wet-sand resin (always use waterproof sandpaper for this). I usually use thumb tacks to hold the sandpaper still and flat, and I have a special length of pine, which is perfectly flat, that I pin it to. Then I dip the part into water and begin sanding, frequently dipping the part to remove the resin slurry and to add more water. Another benefit to wet-sanding is that it keeps the sandpaper from becoming clogged with resin, so it will last longer.

Bubble voids are easy to fill with super glue, putty, or Evergreen strip stock. For voids on flat or large curved surfaces, use thick gel super glue or resin. Testors putty also is great for this. For small voids use automotive crack filler or a thin super glue applied with a small-diameter wire applicator. Sometimes the voids are so small that the surface tension of the super glue won't allow it to seep into the tiny area. In these cases, enlarge the hole slightly with a drill bit if you are using super glue, or else use automotive crack filler. I have found myself using automotive crack filler more and more these days to deal with small voids because this stuff is easy to use, dries fast, wet-sands easily, and blends perfectly with resin. Super glue accelerator won't affect resin, so you can use it to speed up the drying of super glue.

You can also use Evergreen strip stock to fix small shapes and correct problems in corners, on edges, or on the

rims of circular shapes. Use a strip size that fits into the hole, dip the tip of the plastic in a puddle of super glue, and insert the tip of the strip into the hole. When the glue is dry, cut the plastic and trim and sand to shape.

Once you have fixed any problems, give the parts a final cleaning with soap and water and apply a coat of primer. The primer will act as a final check for any voids or bubbles you may have missed. They are easy to miss, especially with light-colored resin parts, because the light color will tend to make your eyes "snow blind." Once the parts are completed, they are ready for final painting and assembly.

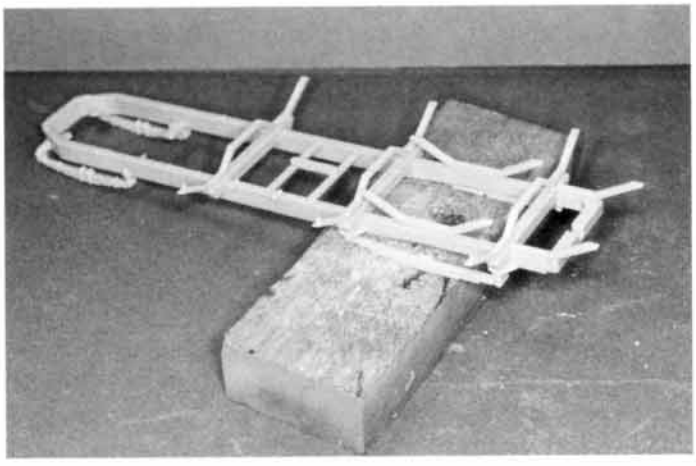
Metal tips. To close out this chapter, let's talk about working with brass photoetching and white-metal and brass castings. Always cut photoetching with a sharp blade and cut the parts on a hard surface such as a glass or Plexiglas plate. Some manufacturers suggest in their instruction sheets that you can cut off parts with metal scissors. I recommend against this—it is too easy to damage parts or to cut into adjacent parts. Generally, it's easier to cut a photoetched part off its tree by leaving a little of the stub attached to the part. You can easily remove the remaining stub from the part by using a number 11 X-acto blade and then smoothing the edge with a Flex-I-File sanding stick. Generally, photoetched sheets are between five thousandths (.005) and seven thousandths (.007) of an inch thick, but I have also worked with brass sheet as thin as three thousandths (.003) of an inch. With photoetched sheets being made thinner and thinner, you have to be careful not to distort the parts as you cut them off the trees and clean them up. An important point here about cutting photoetching—wear your glasses or use a pair of safety glasses. Small photoetched parts, especially the stubs, have a bad habit of becoming projectiles when they are cut, so protect your eyes!

Once the part is cut off, clean the surfaces of the part by lightly running it across a stationary piece of 600-grit sandpaper taped to your workbench. Some modelers prefer to clean the entire detail sheet at once by laying it flat and carefully running the sandpaper over it. While this may be quicker, you also stand a good chance of damaging individual parts, so I recommend doing them one at a time. Don't slide the sandpaper back and forth, and only a few passes at the surface will be needed to clean it up—when it's shiny, it's clean. Cleaning up photoetched surfaces is a must if you are gluing sections together.

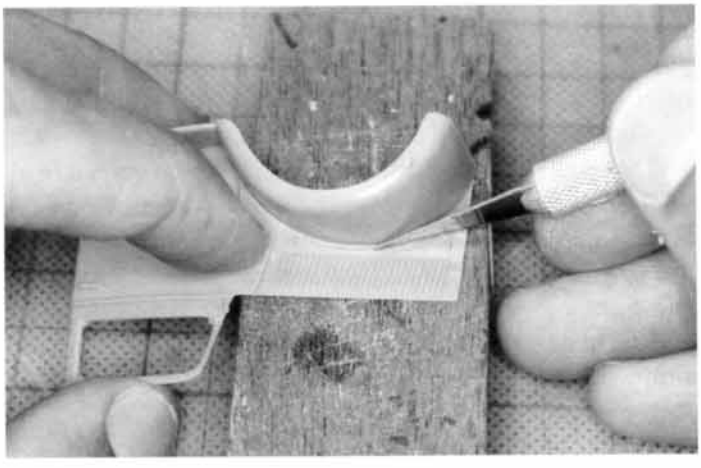
To get curves in photoetching, bend the part around a wood dowel or other round object that has a slightly smaller diameter than you need. The photoetching will spring back a little, so the smaller diameter is important. You can get sharp bends and angles by using a set of flat needle-nose pliers, or by using two single-edged razor blades.

Super glue is an excellent bonding agent for both brass and photoetching, and when strength is not an issue, white glue also works well. Using white glue will allow you some flexibility in positioning pieces together correctly, but be sure to prime the parts prior to gluing, as the white glue will stick better to flat paint than to bare metal. White glue is also an excellent filler for cracks and voids when you're using photoetching. Be sure to prime photoetching before you give it a finishing coat of paint.

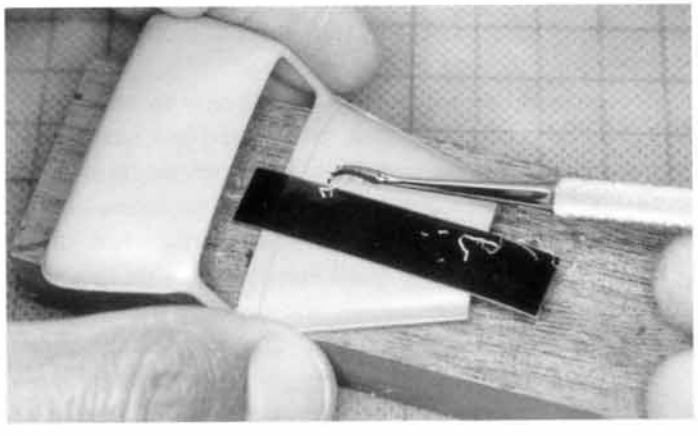
Brass and white-metal castings are easy to work with. They can be scraped, sanded, and shaped just like plastic. These metal castings can have mold release agents on them, so give them a good cleaning with an enamel-based paint thinner. Like injection-molded parts, white-metal parts typically have very small seam lines, although they can be difficult to see because the metal is shiny. Scrape and sand the seam lines just as if they were plastic. Brass castings can also have seam lines, but the metal is much harder, so scraping may not remove them entirely. Use sanding sticks or even a small fine-tooth file. When you are satisfied with your work, give the parts a coat of primer. This will highlight any seam lines you may have missed. Brass and white-metal parts are soft metals, and sometimes they may be bent when you get them. To bend them back into shape, carefully work out kinks with a set of flat-faced needle-nose pliers.



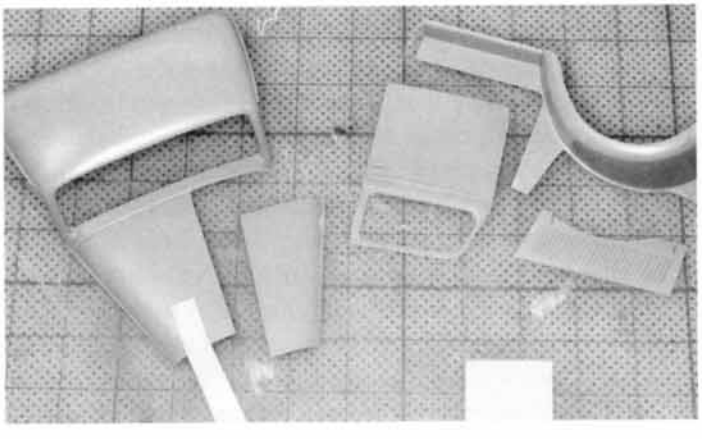
Military vehicles can be a lot of fun to build. The frame and leaf springs on Heller's Opel Blitz have been assembled, and the next step will be building up and detailing the cab, engine, and engine compartment.



If you plan to detail the engine compartment, you'll have to cut out the hood. Since the scribe line that outlines the side hood is distinct and deep, use the tip of a number 11 X-acto blade to cut out this part.

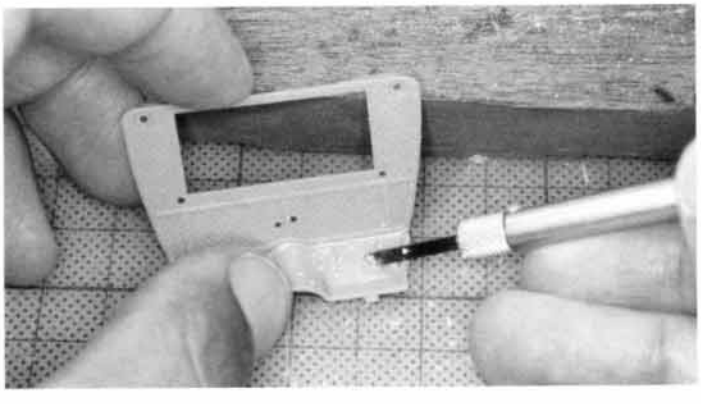


Since the hood top does not have a distinct engraved line, use Bare Metal Foils plastic scriber to cut out this part. Labeling tape acts as a guide for the scriber.

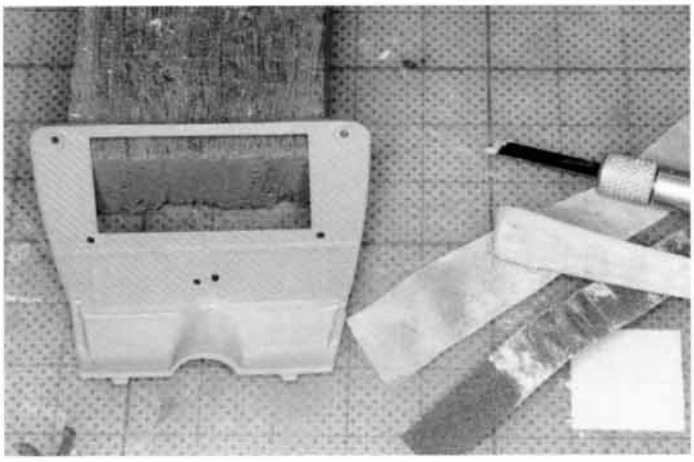


Cut out the hood parts as well as the door, and clean the edges.

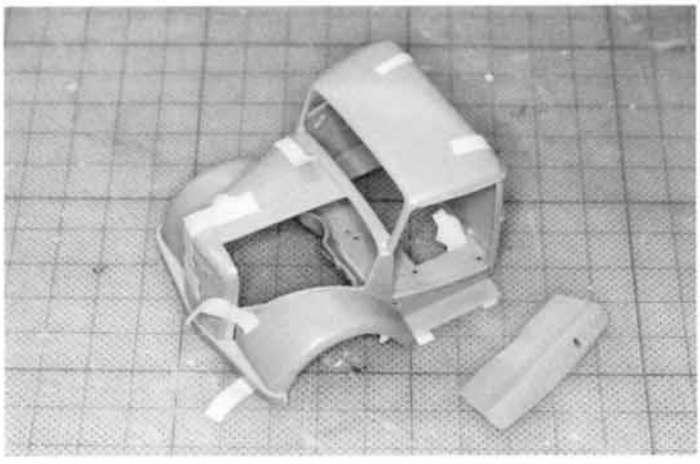
When you cut out parts to display interior areas, don't forget to check the undersides for positioning tabs. Remove a tab like this with a stencil knife.



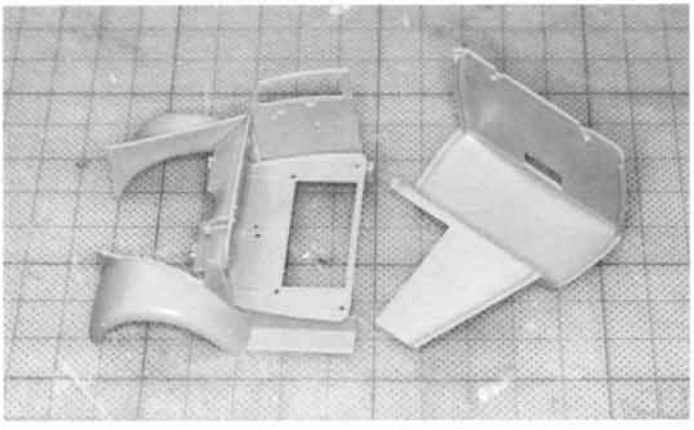
Carefully remove the molded-on gas, clutch, and brake pedals from the floorboard using a stencil knife. You will scratchbuild new ones.



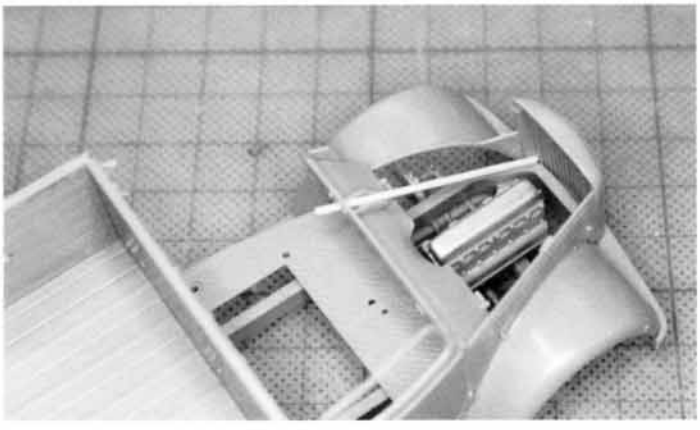
Sand smooth the floorboard area with various grades of sandpaper.



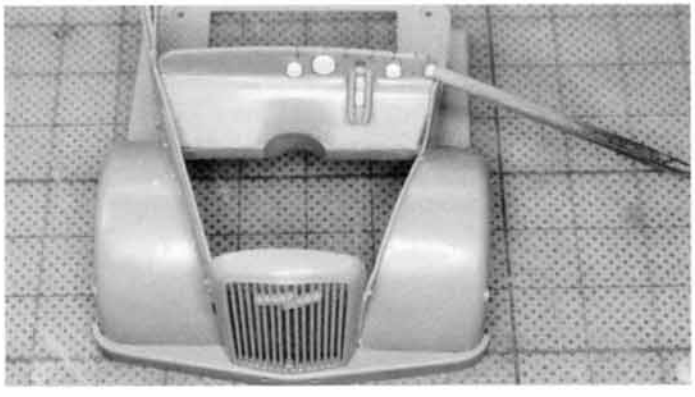
The cab must be assembled in such a way that you will be able to access the interior of both the cab and the engine compartment to add details. This is another good example of deviating from the instructions and creating your own assembly steps.



Glue the cab together into two subassemblies.



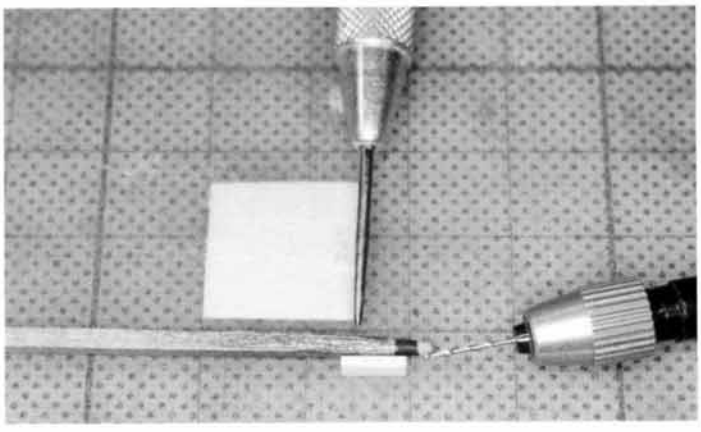
Once the engine block is assembled, temporarily place both the engine and the forward cab area on the chassis so that you can accurately position the steering column.



Add plastic disks punched out with a Waldron punch tool to represent the back side of the dashboard instruments.

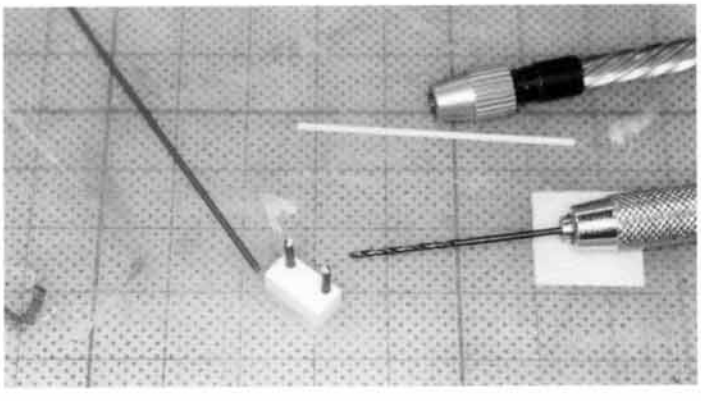
Use a NorthWest Short Line chopper to make the battery shelf parts. The chopper is a great tool for making identical multiple parts.

Use a NorthWest Short Line True Sander to true up the sides on this small part, which will become the fuse box.

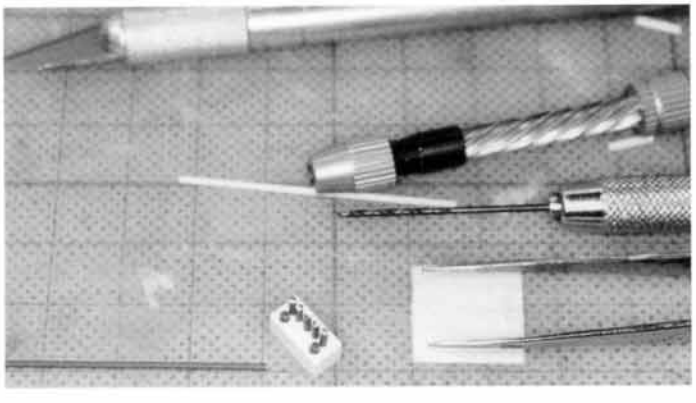


Use a tiny drill bit to drill holes on the sides of the plastic strip for the wires. Once you glue this part into place and insert the wires into the holes, it will look just like a fuse box.

Here the dashboard and fire wall have received all their scratchbuilt components, including the back side of the glove box.

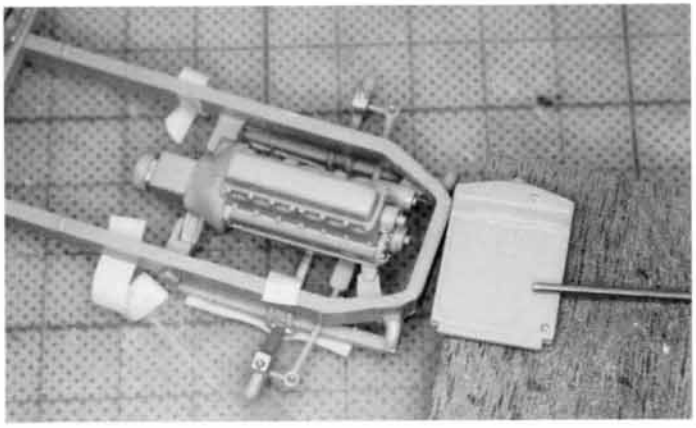


Glue together two pieces of thick Evergreen strip to create the right thickness for this future battery. Cut down the length using a razor saw and miter box, then true up the sides with a True Sander. Install the battery posts as in this photo. The next step is to trim them to the proper height.

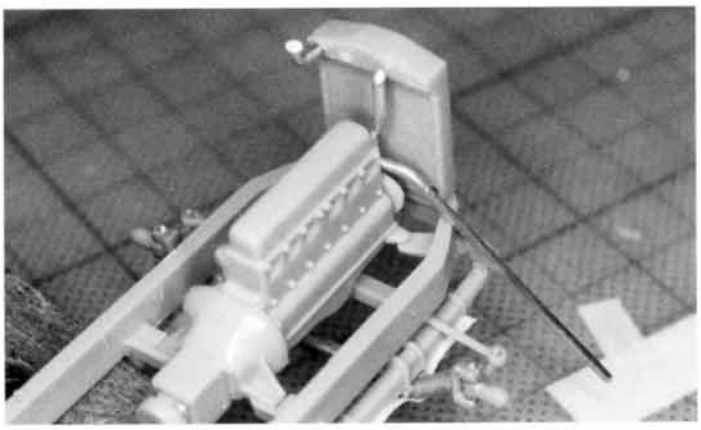


Add the battery cell caps, and trim them to size. Use a sanding stick to carefully sand down the stubs to the proper height.

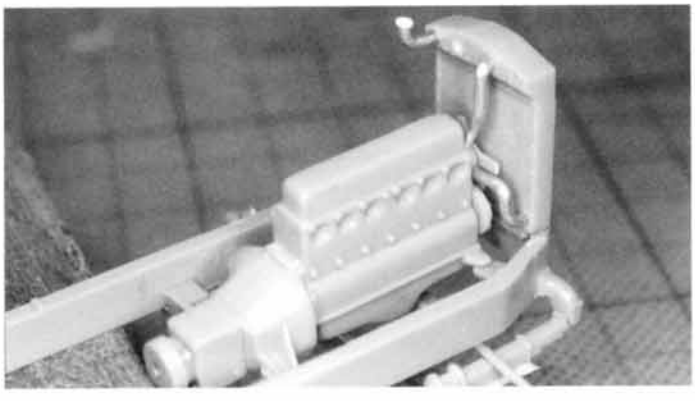
Here the battery gets one last fit check on its shelf. Temporarily tape the rear half of the cab into place to ensure that the battery doesn't interfere with the hood.



The model did not come with intake and return radiator hoses, but they are easy to add using brass wire.

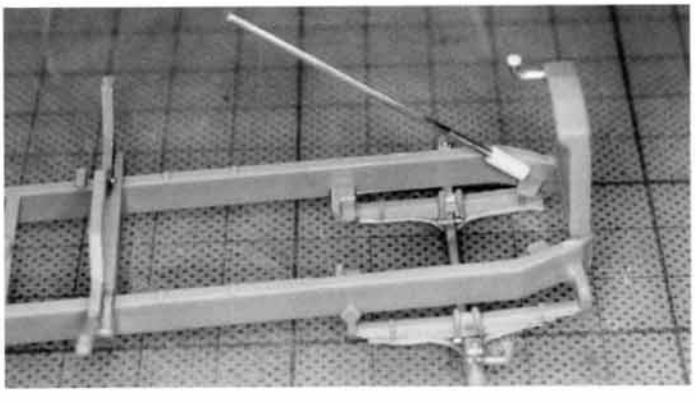


After giving the lower hose a few more bends, cut it to size. Form-fit both hoses using a trial-and-error process. Also notice that I moved the filler tube. This is because the molded-on filler tube interfered with the hood.

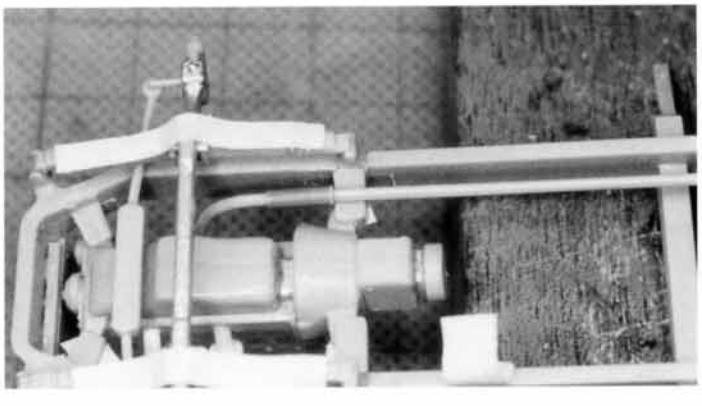


The brass radiator hoses are complete. Once you paint them, they add yet another dimension of detail to this engine compartment.

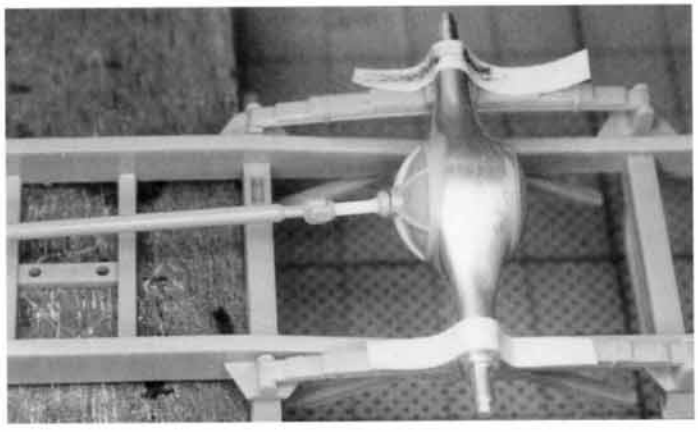
Make the clutch, brake, and gas pedals from scraps of Evergreen strip and rod stock. They look much better than the original molded-on pedals looked.



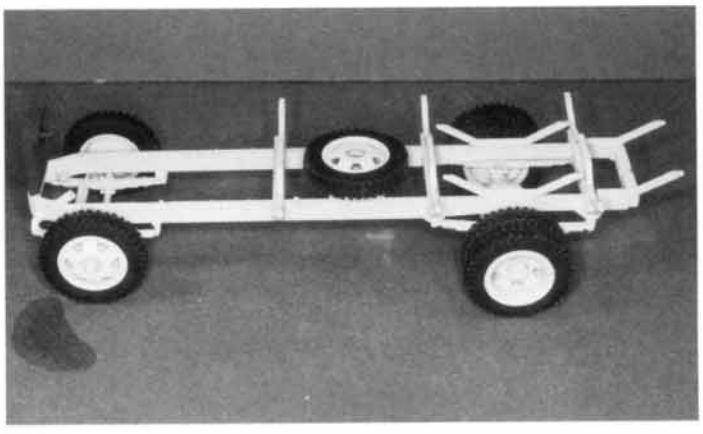
Positioned the steering linkage tube and glue it into place.



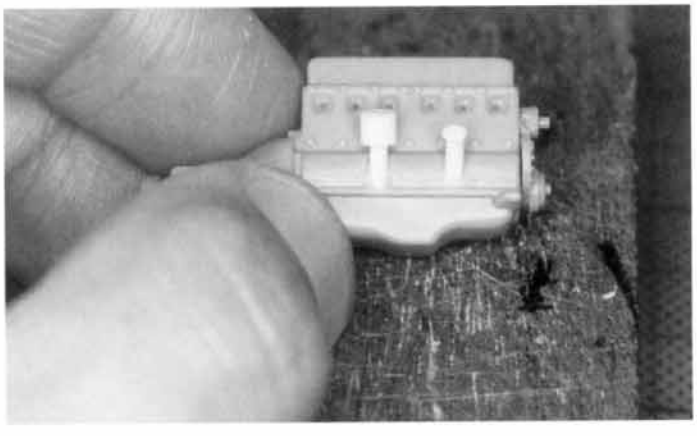
Attach the manifold to the exhaust pipe using a small length of plastic tubing. The tubing simulates couplings that you sometimes find on real vehicles.



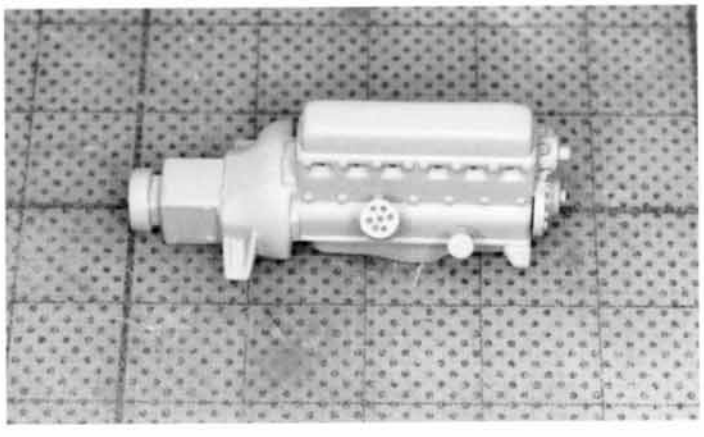
The drive shaft on this kit was too short, but a short length of Evergreen rod fixed the problem.



Complete and paint the frame and add the tires. Once the engine is installed, it's going to look like a real vehicle.

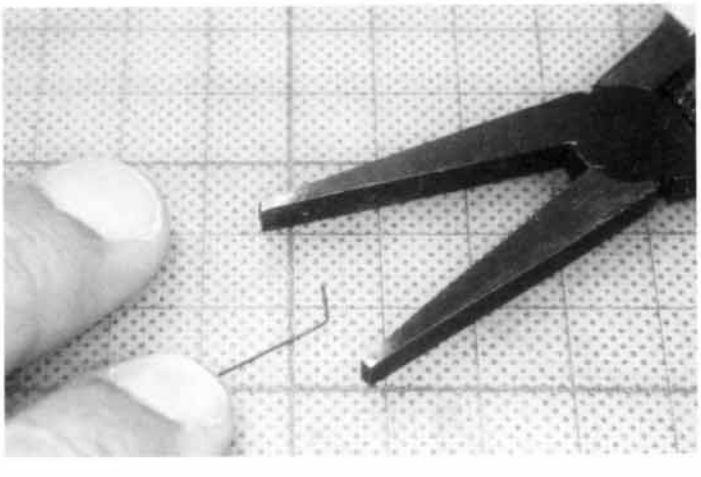


The kit's engine did not have either a distributor or an oil filler tube. Reference pictures showed both of these parts to be on the right side of the engine. Make the distributor from two different diameters of Evergreen rod and the filler cap with a Waldron punch tool.

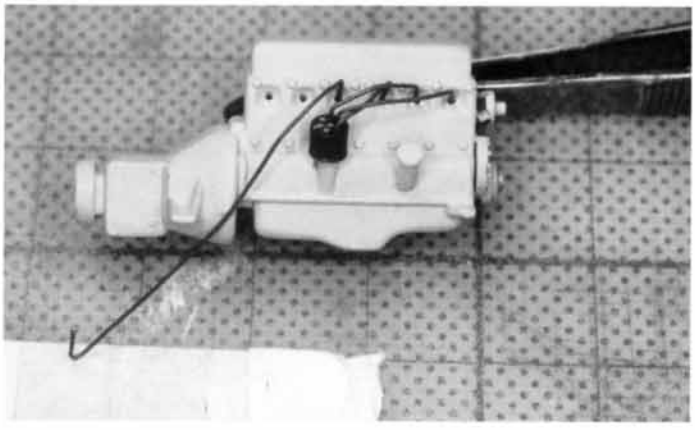


If you plan to wire the engine, drill six spark plug wire holes as well as the ignition coil wire hole in the distributor cap.

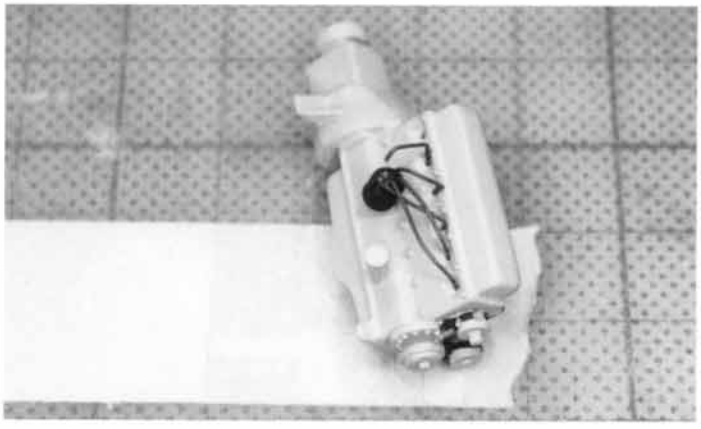
To simulate the rust/burnt iron appearance that you typically find on manifolds, use Testors Metalizer burnt iron.



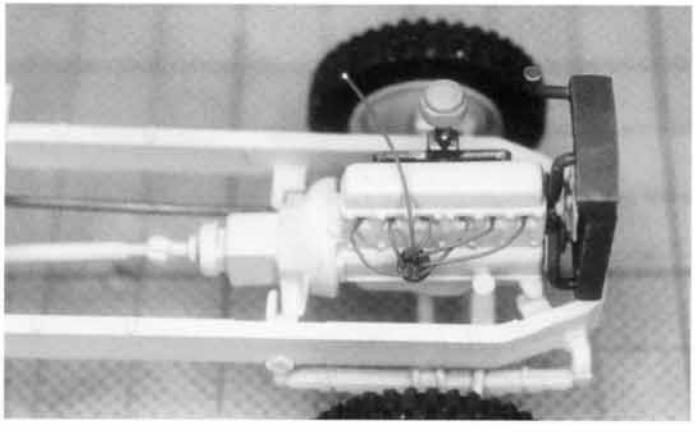
When wiring the engine, use flat-tip needle-nose pliers to make the necessary bends in all your wiring.



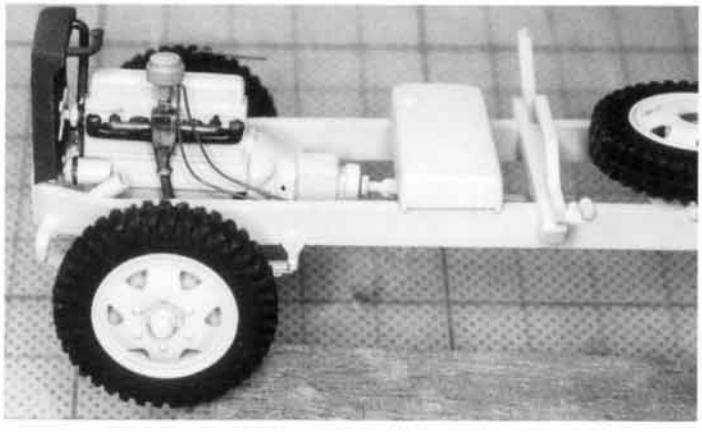
The spark plug wires are progressing. Form-fit each individual wire into place.



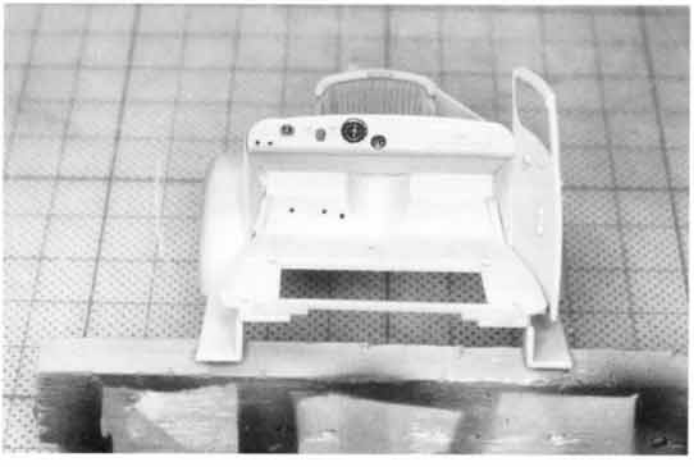
Wiring is just about complete. Note the bend on the tip of the wire that will be inserted into the top of the distributor cap.



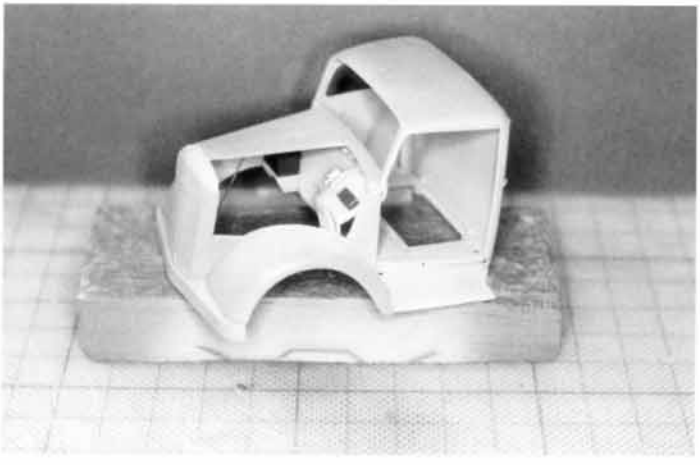
Install the engine. The ignition coil wire will hang free until the cab is attached to the body.



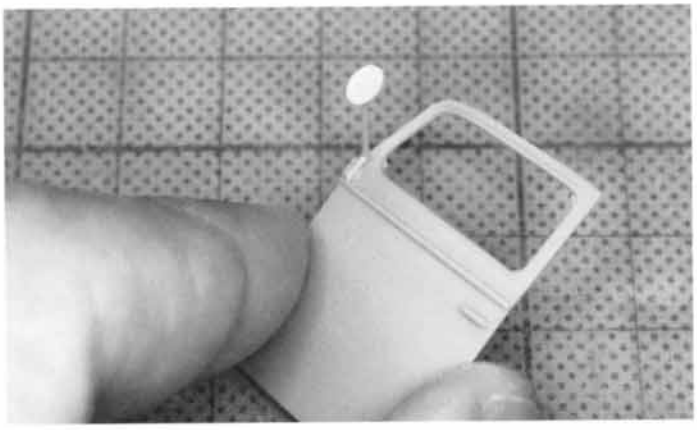
Install the carburetor along with the linkage and fuel line, as well as the radiator and its hoses.



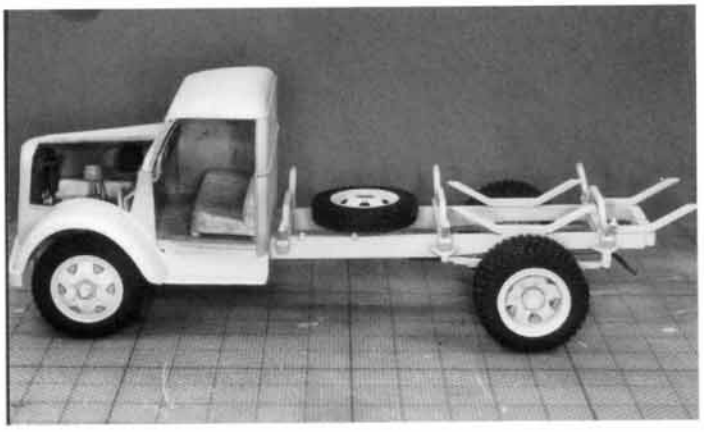
To simulate the dashboard dial faces, punch out decals and attach them to the dashboard.



Here is the assembled cab. The next steps are masking and painting.



Replace the kit-supplied rear-view mirror with a slightly larger one, courtesy of your Waldron punch tool.



Now install the cab on the frame. This model is really starting to take shape.

The scratchbuilt clutch, pedal, and brakes add yet another level of detail to the interior cab of this model.

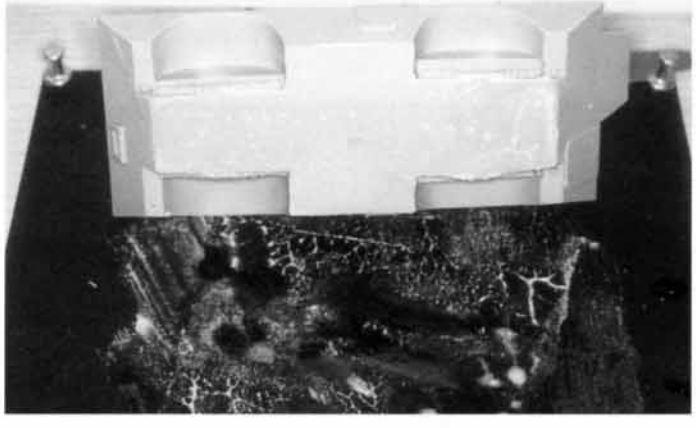
Complete the engine compartment and position the hood. Opening up the hood to display the engine compartment of this model makes it a real eye-catcher.

Attach the canvas top for the truck bed as well as the remaining detail parts. Use dilute coats of dirt- and mud-colored paint to weather this model.

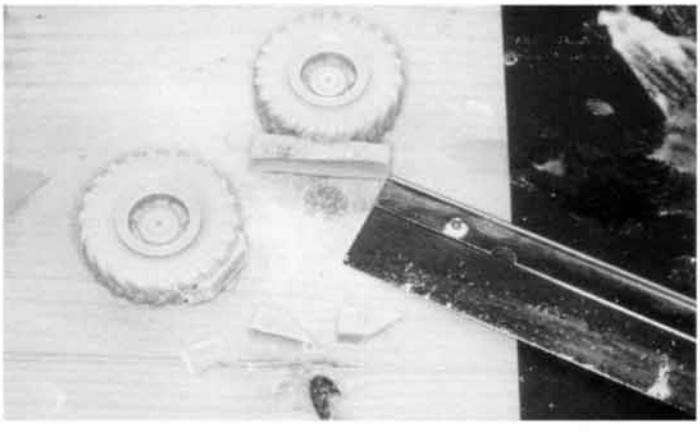
Resin kits usually have complete cast parts that need to be cleaned up and painted. The body on this Verlinden armored car is one huge hunk of resin.

Resin kits can also contain a lot of parts. The major advantage of resin kits is that you don't have to deal with mold or seam lines.

Clean resin parts with warm water and soap to remove all mold release residue.



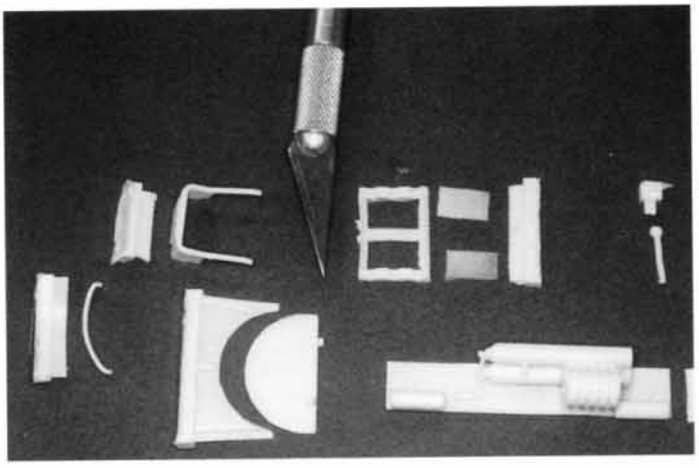
Large, shallow casting blocks on large resin pieces are easy to remove by running the parts across a stationary piece of sandpaper. Always wet-sand resin; then you don't have to worry about inhaling the resin dust.



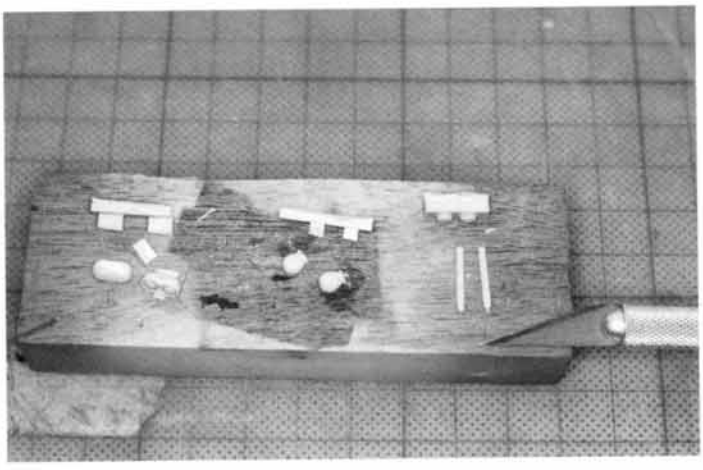
Use a razor saw to remove the pour blocks from these tires.

To remove the remaining resin from the pour block, run the tires across a stationary piece of sandpaper. Since tread on the tires will be missing because of the pour blocks, these locations will become the place where the tires contact the road.

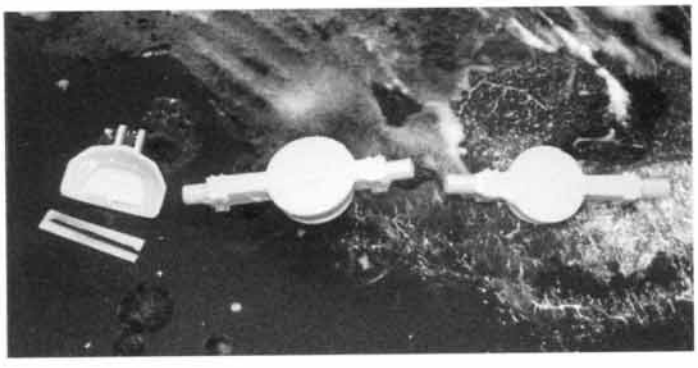
Use a sanding stick to clean up the sides of the tire where the pour block was located.



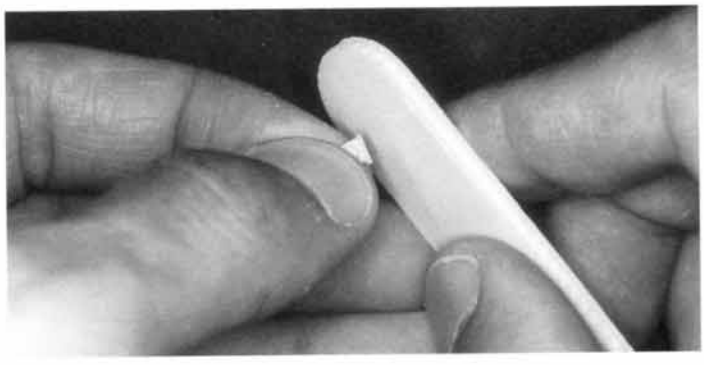
Some resin kit manufacturers engineer the pour blocks on their parts so that they can be easily removed with a sharp number 11 X-acto blade. In some cases, they can be snapped off.



If the pour block attachment points on the parts are thick, as the ones in the photo were, you'll have to remove the parts carefully, leaving excess resin to trim and sand away.

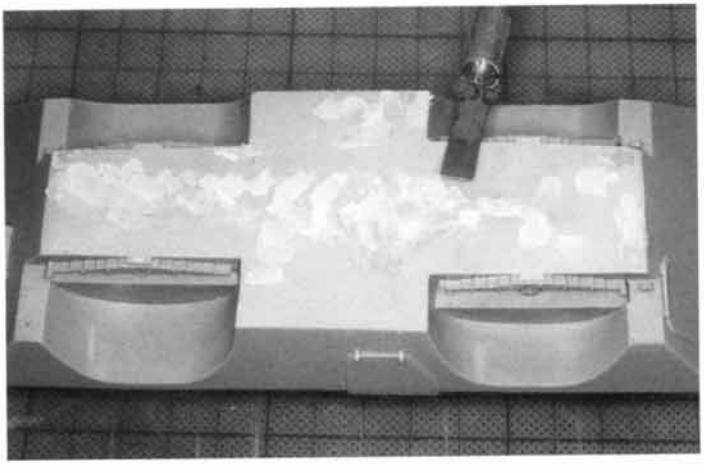


Sometimes you can remove this excess resin by running the parts across a stationary piece of sandpaper. This also works well for flattening out gluing surfaces.

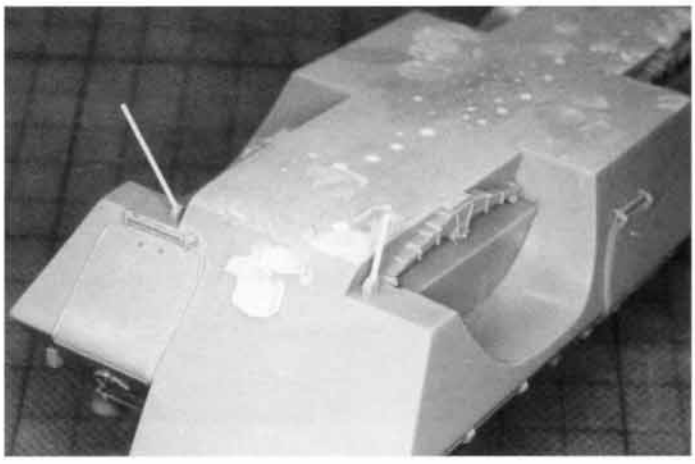


Use a sanding stick to remove the excess resin and to also reshape the part.

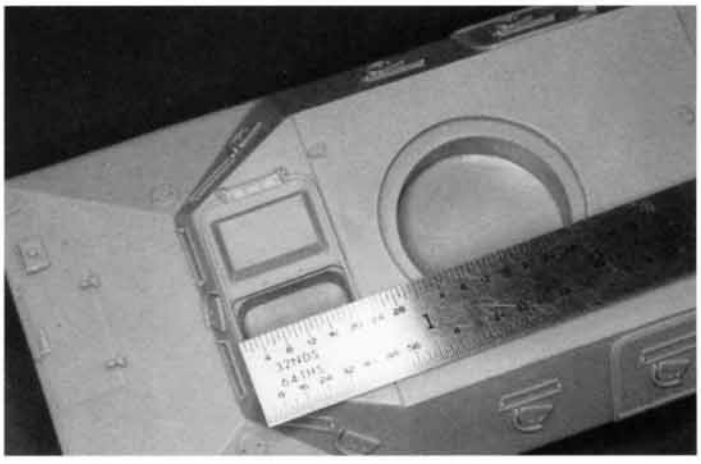
Sometimes you can't cut down pour blocks with a razor saw, and it's too time-consuming to sand them off by hand. In these cases, use a sanding disk.



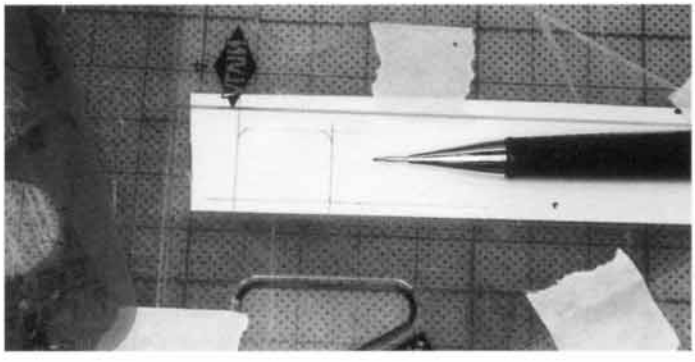
There were bubble voids on the bottom of this Verlinden armored car. Although they would not be visible, I filled them with Testors putty.



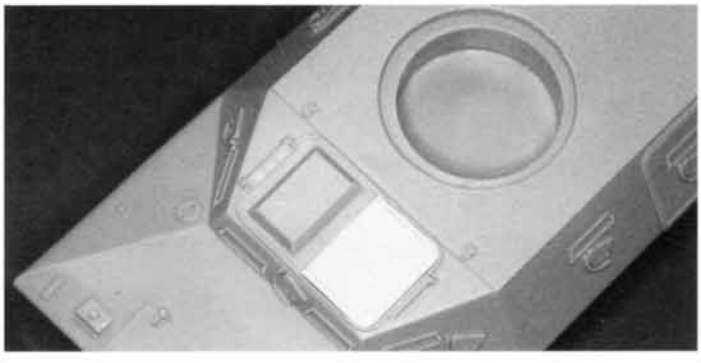
To repair bubble voids in small locations, Evergreen rod and strip stock works great as a filler. Dip the tip of the plastic into a puddle of super glue, insert it into the hole, and then trim and sand to shape after it has dried.



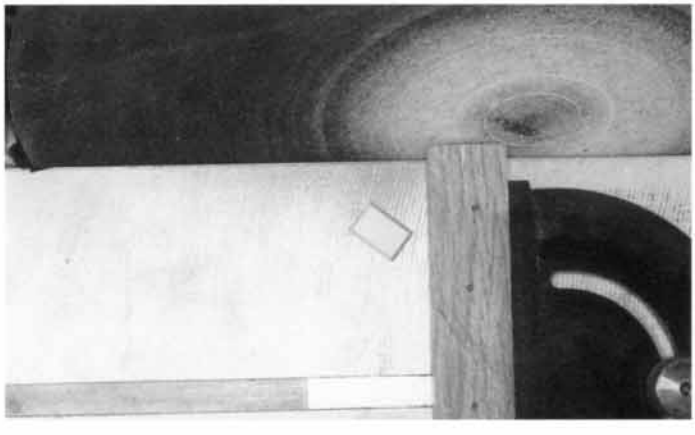
Since I damaged the kit-supplied hatch, I had to make a new one. A machinist's ruler is great for precise measuring.



I used small triangles to measure and draw the new hatch cover.

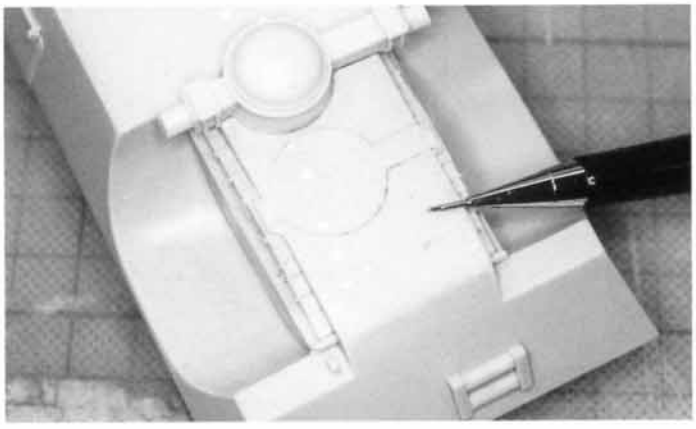


I cut out the new hatch cover and form-fitted it into place.

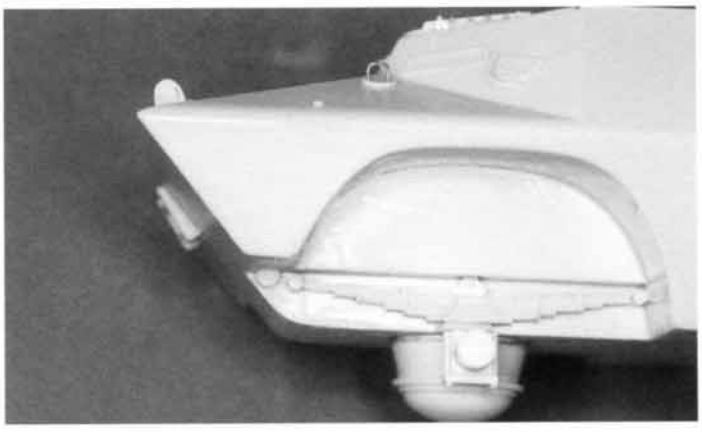


I could have done the angles on the hatch box using a True Sander, but it was quicker and easier to use my trusty sanding disk. If you want to do any serious scratchbuilding, I recommend that you invest in a variable-speed disk sander with an adjustable table. Both Micro Mark and Model Expo sell these high-quality machines.

The hatch is now complete and is getting its final fit check. Make the hinges by cutting up disks punched out with a Waldron punch tool. The bolt head details are Grandt Line bolt heads.

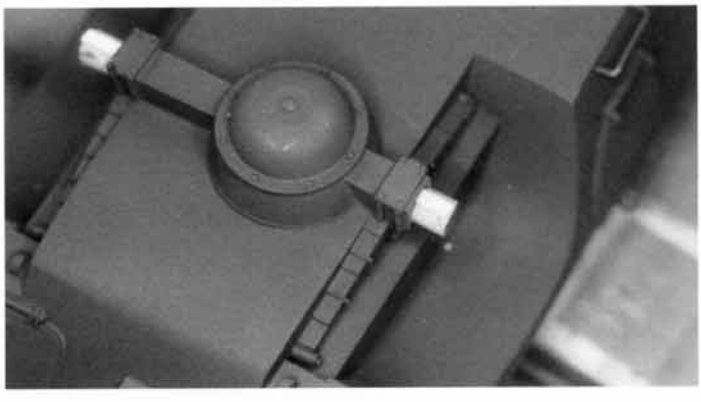


Since there are no location pins on resin kits, position the part and then outline it with a soft lead pencil. When you are ready to glue the parts in place, you can use the outline as a positioning guide.

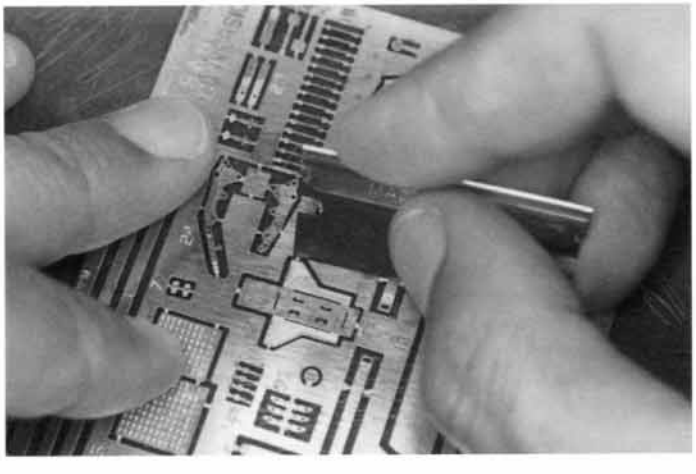


Install small, delicate resin parts like this lift ring first and then drill out its center. Typically, the resin in the areas that must be drilled or cut out is very, very thin.

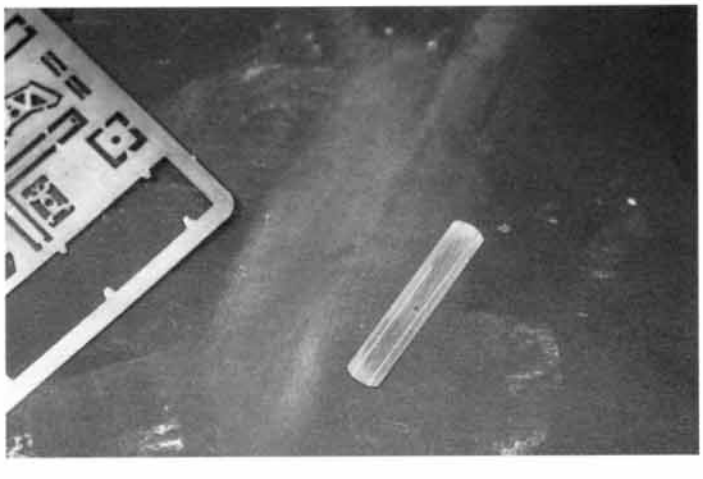
Use stiff brass and soft copper wire to make the brush guards, lift handles, and lifting rings on this model.



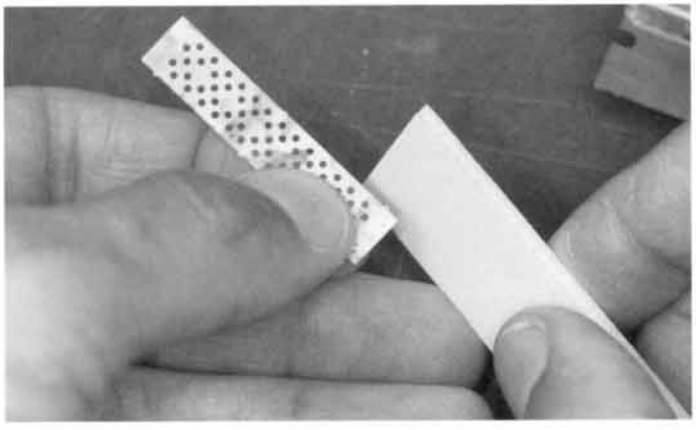
The axles on this Verlinden kit have a smaller diameter than the holes of the tire rims. The simple solution is to add some small strips of Evergreen strip stock to the axles.



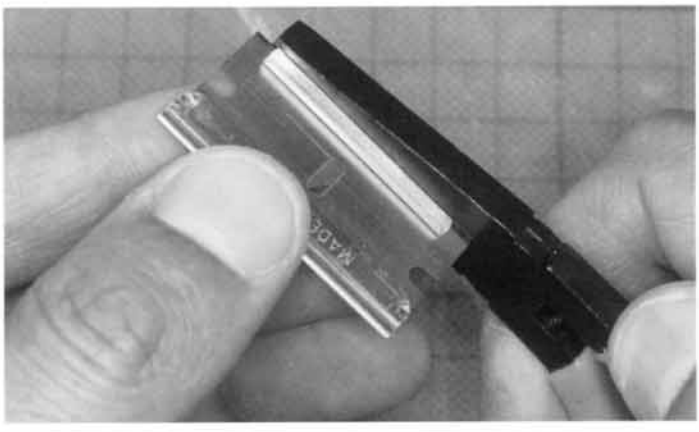
When cutting out brass photoetching, lay the sheet on a hard surface like Plexiglas or a glass plate and use a single-edged razor blade to cut out the parts. Wear eye protection!



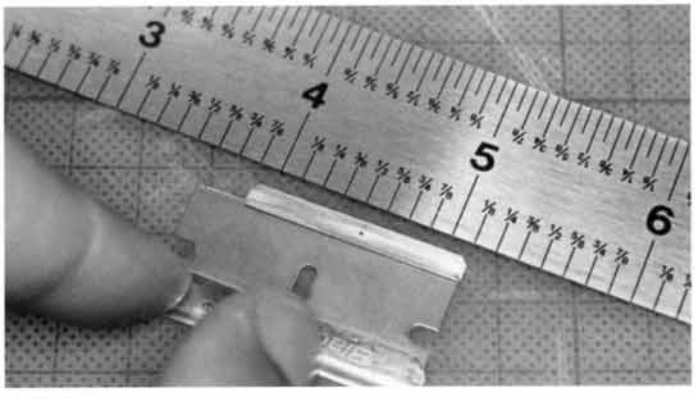
After you cut them out, clean photoetched parts to remove any chemical residue. Run the parts across a stationary piece of fine-grit sandpaper to remove tarnish and chemical residue.



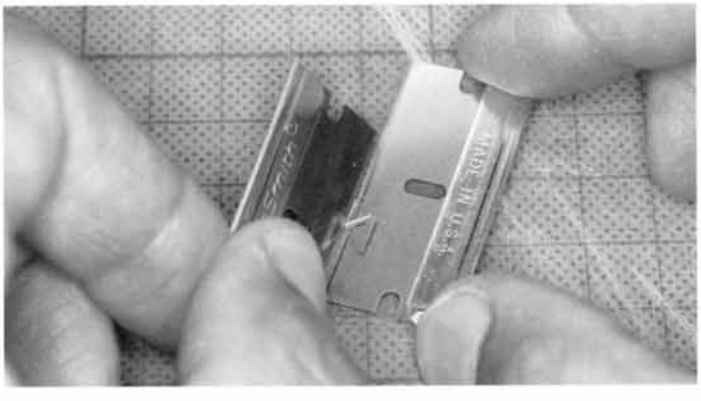
Sanding sticks work well to sand off the stubs that attach the photoetched parts to the trees.



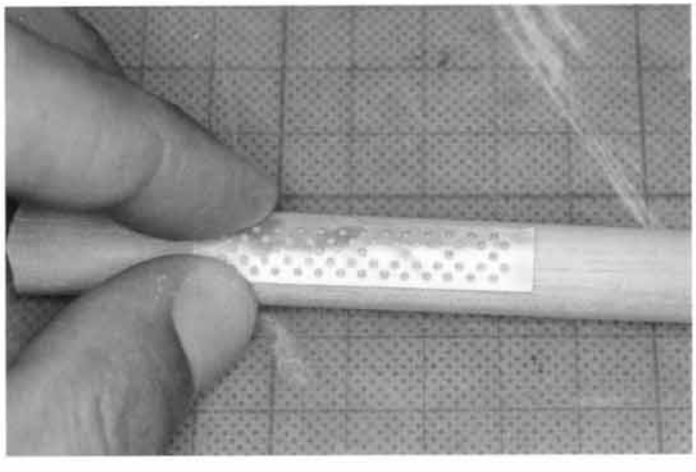
Bend photoetched parts using flat-nosed needle-nosed pliers.



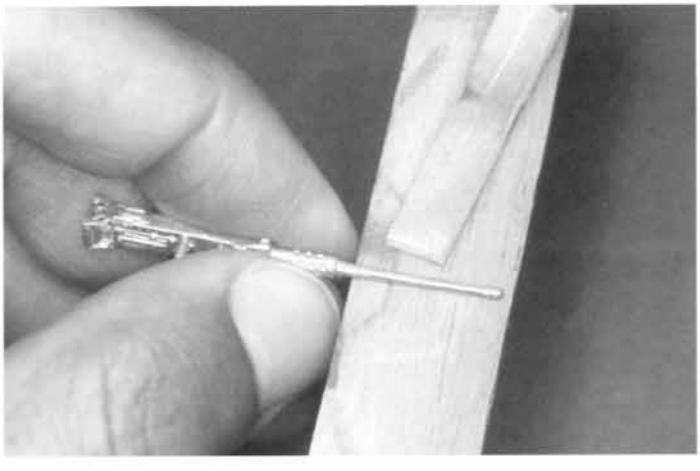
If you need a long bend in a photoetched part, another method is to use a steel ruler and a single-edged razor blade.



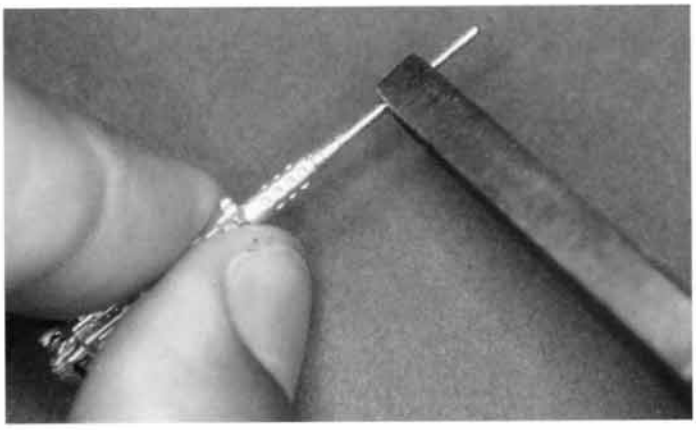
For little bends, use two single-edged razor blades. Position one razor blade at the bend location, slip the other razor blade under the part, and simply rotate upwards.



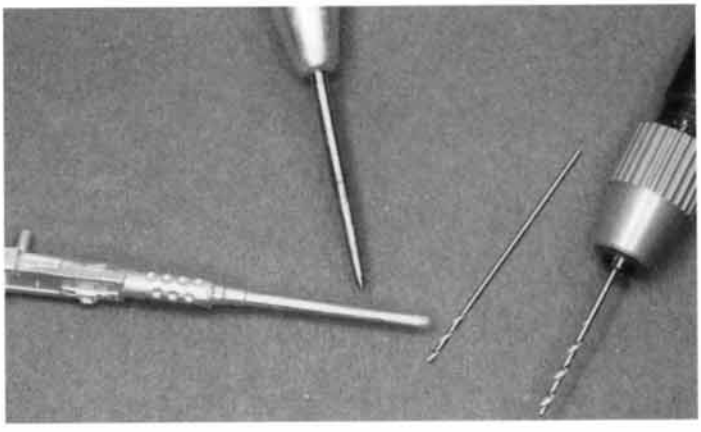
Wooden dowels are great for making curves in photoetching. Use a slightly smaller-diameter dowel, as the photoetching will have a tendency to spring back.



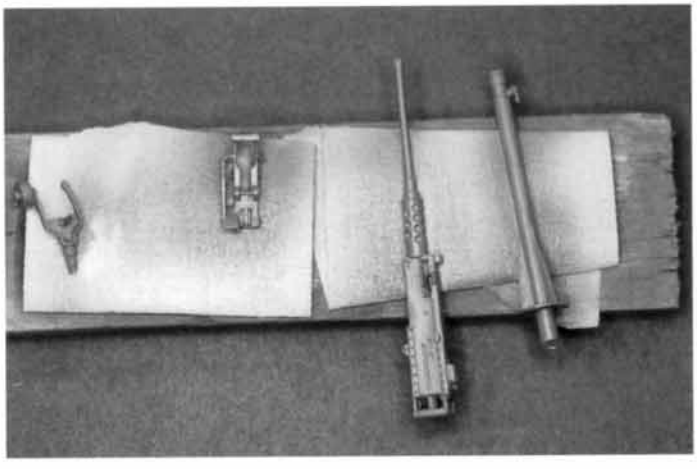
Sand the seam lines along brass castings—the brass casting will not respond well to scraping with an X-acto blade.



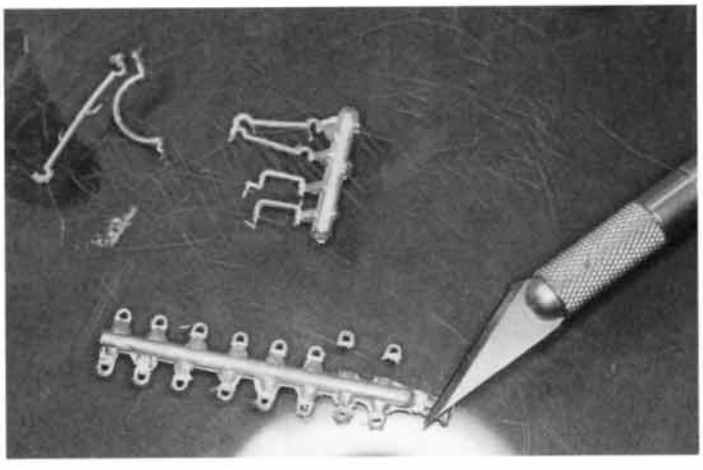
Since thick brass is fairly stiff, it takes a little work to straighten out cast-brass gun barrels. But because the brass is stiff, you will not typically find brass barrel lengths that are wavy in appearance, as white-metal ones can be.



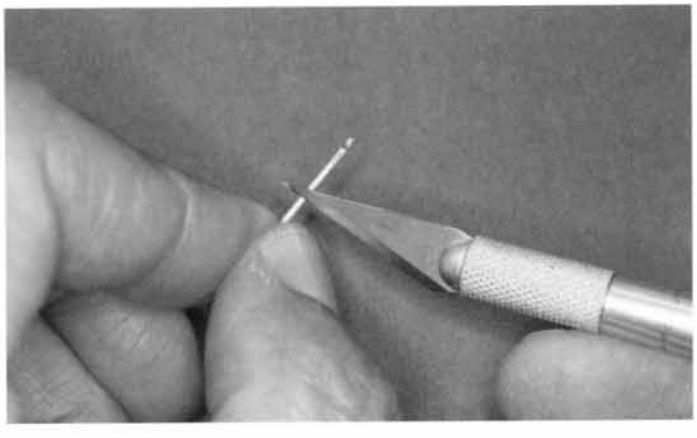
You can also drill out cast-brass barrels. You just have to be patient.



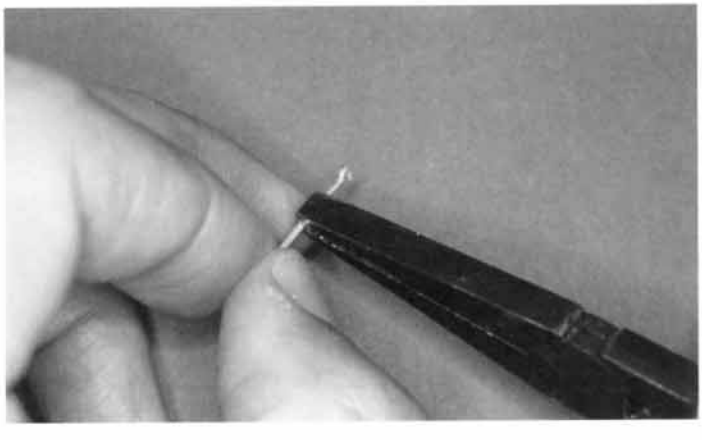
Prime the brass castings to check for flaws and seam lines that you may have missed.



Cut white-metal parts from their trees on a hard surface just as you cut photoetched parts.



A number 11 X-acto blade works well to scrape off the mold lines on white-metal castings.



White-metal castings tend to be wavy. It takes a bit of patience with flat-nosed pliers to straighten them out. Work from one end of the casting and straighten out the rod as you progress.