

CHAPTER 4

ENGINES AND LANDING GEAR

DETAILING ENGINES

Aircraft with radial engines have big cowling and consequently large opening which show off most of the face of the engine. All radial engines have a wiring harness, which is located at the base of the crankcase in the shape of a ring. The individual spark plug wires emit from this ring and metal jackets protect both the ring and the wires. The wires for each cylinder are located next to one another on the ring with a wider space between sets of wires. One spark plug location was always centered on the front of the cylinder and the other was located either on the top or on the backside of the cylinder.

If the kits radial engine has a separate wiring harness or has one molded to the engine their are most likely stubs along the rings circumference where the wiring emits. Use a pin vise to set the drill hole locations and then use small drill bits to make indentations for wiring. If the ring has no stubs you can mark the wiring harness for the correct number of cylinder sets and then drill small holes in the ring with a pin vise and a small drill bit so that the wires you add will have a

positive seating.

You will also need to drill holes in the cylinders at the correct spark plug locations. Be sure that the drill bit size that you use matches the size of the wiring you plan to use. For 1/48 and 1/72 scale engines you can use strands of electronic wire, and for 1/32 scale kits use brass-beading wire. You can also purchase photoetch detail sets for engines and they always include a wiring harness and the correct number of spark plug wires. These detail sets are specifically designed for a particular model kit and the photoetch parts fit onto the kit parts very well.

After you have completed drilling the holes for the spark plug wires, prime the subassemblies and then give them a coat of Testors gloss gull gray. To accent the cylinders and highlight the cooling fins hand paint them Testors non-buffing gunmetal metalizer. Testor's metalizer paints are thinned for airbrushing, but the non-buffing types can be applied with a brush to small areas. Due to the thinned consistency of the paint, and the fact that these paints do not adhere very well to gloss enamels, the paint will flow into the areas between the cylinders cooling rings while only slightly staining the tops of the them. This will result in a two-color appearance to the cylinders and highlight the detail.

The tops of the cylinders are usually a darker color than the cylinder's body, and to represent this paint the tops flat black or Testors non-buffing exhaust color metalizer. To accent the crank case bolts I paint them Testors silver, applied with a sharpened round toothpick. To add a final touch I add a small square or rectangular black decal onto the crankcase to represent the manufacturer's plate. Photoetch detail sets usually come with several manufacturer plates for different locations on the engine.

Push rods that are separate parts can sometimes be misaligned with the engine cylinder heads. In these cases I recommend that you cut the push rods off at their base and replace them with round plastic stock. You will need to form fit them one at a time and I recommend that you paint them prior to installation. The easiest way to do this is to paint a few lengths of round stock, cut approximate lengths, form fit each one into place and then attach them with super glue.

To weather the engine I dust it with a mixture of brown and black pastel dust applied with a soft brush and then I airbrush a coat of clear flat to seal the pastel. Remember that these stains need to be very subtle so do not over do it.

The last step is to add the wiring. You need to determine what color the metal covering that protects the actual engine wiring: usually this was a copper, black or a bright metal color. After you paint the wire strands glue the wires around the harness at the base of the crankcase and then form fit them, one cylinder location, at a time. I usually do the front wires first, and then locate the wires for the backs of the cylinders. If there is a second row of cylinders, I work on the front row first and then complete the back row.

If you decide you want to add wiring to an inline engine you will need to plan to remove one of the cowling covers so that you can see the detail that you worked so hard to add. This means additional work for cutting out the panel, thinning it and adding framing to the inside of the cowling area. If there is molded on wiring to represent the spark plug wires scrape the detail off using a

number 11 X-Acto blade and smooth it out with a sanding stick, mark the locations of the spark plug wires and then drill holes for their locations. The spark plug wires are usually wrapped together and distributed along the length of the block. To achieve this effect you will need to glue them individually in place and then bundle them together as you move toward the rear of the engine. As you bundle the wires apply tiny drops of super glue to hold everything in place.

You can highlight detail on in-line engines by painting different parts of the engine various shades and colors. The block is usually one color and the top of the engine and the rear components are usually different colors. The engine mounts and framing can be painted various shades of the same color. The overall effect of adding wires, painting the engine and mounts different colors and some weathering can turn even an average in-line engine into a masterpiece.

Another approach to detailing the engine is to purchase an after market resin engine which usually comes with all the parts in resin and photoetch that you need to make a real eye catching engine. Some of these kits are models in themselves. Some of these after market resin engines are well engineered and fit together well and also fit onto your model without much effort. If the aftermarket kit has fit problems chances are the engine will also need to be modified to fit correctly onto the fuselage and within the area of the cowling.

If you are going to add detail to a jet engine you will need to decide how to open up access panels to see the detail. For this reason most jet aircraft kits do not have engines although newer kits, especially those in 1/32 scale are now including them. Molded on piping and wiring is very difficult to remove without marring the engine so I recommend that you add additional piping and wiring to provide a perception of depth. Use various size plastic rods, especially if you are running several lengths together and always use super glue to attach them to the engine. Thin electronics solder also works well because it easily conforms to the shape of the engine. Junction boxes and other types of appendages can be added using various sizes and shapes of small square stock. Dry brushing to highlight detail is another technique you can use to bring out all the subtle surface detail molded onto the parts.

If there is no jet engine you can enhance the intake area by sanding off the backing of the jets engine fan. Run the part across a stationary piece of sandpaper in circle 8 motions so that the plastic is removed evenly around the part. As the plastic gets thin it will become almost transparent. At this juncture you can use the tip of a number 11 X-Acto blade to remove the remaining plastic and clean up the individual fan blades. Use the part to draw an identical circle on sheet stock, cut it out, paint both parts and then position the circular disk you cut out approximately 1/16 of an inch behind the intake part. This will add an increased perception of depth to the intake area and also add an element of realism because the individual turbine blades will stand out.

PROPELLERS, ENGINE INTAKES AND EXHAUSTS

After you remove the mold lines, give the propeller a coat of primer and then paint the tips the correct color, which is usually yellow. You can get a better shade of yellow if you first apply an undercoat of flat white. When the paint has dried mask the tips with 3M painters masking tape and then apply flat black. I like to add a few drops of flat white to my propeller color so that it is a dark charcoal.

If the propeller's hub is a different color than the blades you will need to mask the blades re-prime the hub and then paint it the required color. Once you are finished painting the propeller, give it a coat of clear gloss. I find that a least two coats are necessary to get a really good clear gloss finish on flat black. Apply the decals to the blades and then seal the decals and restore the flat appearance of the propeller with Testors Dullcote. If you want to weather the propeller dry brush the leading edges with Testors silver.

Exhaust ports can be hollowed out several different ways depending on the type of model you are building and the locations of the exhaust ports. Since these parts can become very fragile after drilling, especially in the smaller scales, all preparations such as cleaning, scraping and sanding should be completed prior to drilling. It is important that the surface that will be in contact with the drill bit be smooth and flat so that the drill bit will not skew off to one side so be sure the tip of the exhaust is flat.

When selecting drill bits start with the diameter that you want the finished hole to be and then select several other sizes that are smaller than the finished diameter. What you want to do is slowly work up to the finished diameter because if you try to remove too much plastic you can fracture the part. Another advantage of working up to the needed diameter is that you can achieve very thin walls if you are careful.

I first place an indentation in the center of the exhaust for a pilot hole and if it is not centered you can adjust it by angling the tip of the punch. Start drilling with the smallest bit and check the centering of the hole. If it looks good move on to the next diameter and so on until you achieve the diameter opening you want. If your drill bit becomes offset from the center you can correct this by removing the plastic from the off centered side using the tip of a number 11 blade. This is a very delicate process so be gentle and go slow. I then move up two drill bit sizes, which usually helps to self-correct the off centered hole.

If the exhaust has an oblong or elliptical shape you can still drill a round hole and then shape the opening to match the shape of the exhaust by using the tip of a number 11 X-Acto blade. Be careful, go slow and check your work frequently. When hollowing out exhausts it is only necessary to go deep enough so that the exhaust port appears to be hollow which is usually about 1/16th of an inch or so.

Cowling flaps, especially on a bomber, look much more realistic if the plastic between the cowlings flaps is removed. This can be done with a thin bladed razor saw. Engine vents can also be drilled out in a variety of ways, depending on the situation. The best way to hollow out these types of vents is to drill a series of very small holes, use a number 11 X-Acto blade to remove the plastic between the holes and then smooth out the sides with micro files. There is little room for error, and repairing gouges can be difficult due to the locations of some of these vents. Be sure that you protect the surrounding plastic with 3M painters masking tape so that if you slip with the drill bit or the files, the surrounding plastic will not be damaged.

Air intakes can be open or have screening covers, so check your documentation to be sure. Fighter planes usually have big air intakes on the front of the cowling or around the front area of

the fuselage, while two and four engine bombers can have intakes on the leading edges of the wings as well as on the engine cowlings. If the area is covered with molded on screening cut it out and add photoetched screening. Photoetched screening can be very hard to cut to an exact shape so I recommend that you attach the screening to the inside area of the part so that you can use an oversized section

Piston engine exhaust ports generally take on an almost rust or mud color because the cast metal they are manufactured from tends to take on that color due to the combinations of temperature and exposure to the elements. To paint exhausts I use Testors burnt metal buffing metalizer, which I polish with a Q-Tip, and then seal with Testors Dullcote.

Jet engine exhausts nozzles are very complex pieces of equipment that can expand and contract depending on the jets speed and whether it is accelerating or slowing down. The nozzles are designed along the same principles as a cameras diaphragm. The diaphragm is a series of metal plates, which slide past one another to form a specific size opening.

If you want a good representation of a jet exhaust purchase an after market resin exhaust that has all the details you could ever want molded onto the resin piece or as add on details. In most cases all you need to do is remove the resin casting block do some sanding to flatten out the surface where the block was and then prime and paint the part.

When you paint the nozzle use Testors buffing metalizer colors and use a Q-Tip to polish the paint. The Q-Tip will only touch the top areas of the strip resulting in a two-tone effect. I like to use combinations of Testors metalizer buffing and non-buffing paints to help highlight details.

DETAILING LANDING GEAR STRUTS AND WHEELS

The first step in detailing landing gear struts is to remove the seam lines and then fill in any injection marks and dimples. The vast majority of kits today have finely detailed landing gear with separate parts for the scissor type framing, which extends outward around the oleo and connects the upper strut and the lower strut, as well as having brake lines. If you are satisfied with the landing gear detail you can proceed to painting them the appropriate colors. I usually airbrush the metal sections of the landing gear first, and then I paint the brake lines flat black with a detail paintbrush. To bring the subtle details of a landing gear you can dry brush it with Testors silver. The brake line clamps are usually a natural metal color so use your detail brush to paint these small details. The last step is to paint the oleo. The oleo is the airplanes shock absorber and it pushes up into the strut and it is usually a very shiny metal, which can be represented with Testors chrome paint.

If your landing gear does not have any brake lines you can make them with stretched black plastic sprue for flexible lines, and stiff brass wire for metal hydraulic lines such as the ones that are found on a B-25 bomber. The brake lines usually terminate near the axle or somewhere on the backside of the wheel hub. I locate the termination point, drill a small hole, place a small drop of super glue in the hole and then insert the brake line into the hole. If the brake line is flexible I bend the end towards the strut after the glue has dried so that the line follows the length of the strut. The majority of brake lines are attached to the landing gear struts with thin flexible clamps

like the ones used to secure the cooling hoses for your car's radiator. These can be simulated using a thin strip of masking tape that is layered over itself one time. There are usually two or three of these clamps on each strut. I always work from the brake line termination point up towards the top of the strut so that any excessive slack in the line can be worked out. To secure the tape I apply a small drop of super glue at the point where the tape ends and then I paint the masking tape with Testors aluminum colored paint.

You can also purchase a specific photoetch detail set for the landing gear areas and they are sometimes included in general detail sets for a particular model. Eduard provides the most comprehensive details sets available for specific models and general sets which can be used for all types of detailing.

The last step is to add some weathering. I dry brush the entire landing gear with a dark pastel dust and then I airbrush a coat of Testors Dullcote to seal the pastel dust. Be careful not to get the flat finish onto the oleo because it will dull the shiny appearance of the paint.

As a final note on landing gear I recommend that you stick with the plastic ones provided in the kit. Although white metal may appear to have better detail, the metal is very soft and if your model has any weight to it at all the white metal landing gear will not be able to support the weight.

Most main landing gear wheels do not have solid wheel hubs, but model manufacturers are forever molding solid wheels hubs with indented round or oblong spoke detail. To enhance the appearance of spoked wheels remove the plastic between the spokes so that you will have an accurate representation of a spoked wheel.

For hubs that have round indentations use a drill bit that is the same size diameter as the indentation and drill out the plastic. Oblong shaped holes are a little more challenging especially if you are working in the smaller scales, but with some patience and small drill bits and micro files you can make just about any shape.

Once you have completed removing the plastic, sand the gluing surfaces smooth by sliding the part along a stationary piece of sandpaper and then glue the wheels together. When you glue the halves be sure that the spokes or holes on both wheel halves line up so that you can see through the hub.

After the glue has dried scrape the seam with a number 11 X-Acto blade and then sand it smooth. Check your work by painting the seam area with silver paint. If you find any cracks apply some super glue to the area and sand it smooth. Unfortunately, doing this also removes any tread detail that the manufacturer may have provided along the seam line, but this can be replaced. Place the wheel in a vise between two pieces of balsa wood to protect the plastic and then take a thin bladed razor saw and cut the tread back into the wheel. When you are done replacing the tread remove the wheel and then sand the wheel with 400 grit sandpaper. This will remove the plastic burs located along the rim of the areas you cut.

You can also purchase after market resin wheels but there is still some work to do on them. True

Details makes a wide range of resin wheels in just about any scale. You have to remove the pour blocks and drill the correct size holes in the hubs for the landing gear axle. Also some after market tires have a flattened appearance to simulate the weight of the aircraft. While the tires may be slightly bulged some resin tires make the tire appear almost flat. You can reduce this flattened appearance somewhat by carefully wet sanding the sides of the tires with a sanding stick.

To paint the wheel apply a coat of primer to the entire part. Rubber is more of a dark charcoal and to achieve this you can mix a few drops of flat white to flat black. Airbrush the entire tire with this mixed color and after it dries place a strip of masking tape over the face of each side of the tire. Next, take a round toothpick or a pencil and run the tip around the edge of the rim where it meets the tire. The tape will stretch and stick to the rim and define the location where the tire meets the rim. To cut the excess tape from around the rim carefully run the tip of a number 11 X-Acto blade along the base of the rim using the rim as a guide. Remove the tape from the rim and then run the toothpick around the base of the rim again to insure that the tape is sticking to the edge where the tire meets the rim. Airbrush primer on the rim to restore a neutral color and then airbrush it the appropriate color. As a final note on this technique, masking tape will not stick as well to gloss paint as it will to flat paint.

If your kit has flexible tires made from rubber or some type of flexible material there may be a slight molding seam along the centerline of the tire. Trying to sand off this seam can mar the appearance of the tire and I have found that putting these parts in the freezer over night helps the material respond to sanding. Another problem with these flexible tires is that they are dust magnets. Every tiny particle on your work bench will stick to them and the way to fix this problem is to give them a coat of Testors Dullcote, but first you need to get rid of all the stuff that is clinging to them. I clean the tire by using masking tape to remove all the stuff stuck to these parts and then I immediately give them a coat of the Dullcote.

DETAILING LANDING GEAR BAYS AND DOORS

Most kits offered today have a lot of detail in the landing gear bays and on the doors but you can still enhance them with photoetch detail sets and careful painting.

If your documentation shows framing and piping and hydraulic lines that are not present on the kit you can add these using different size rod and strips. There is no set size for each scale, but I recommend that you install rod and strip sizes that look "in scale". To represent framing glue strips along the sides using long lengths so that you can position them correctly and use a thin wire applicator to apply super glue to the contact surface. The super glue will seep along the underside of the bottom securing it in place. Once you have completed the framing and attached any photoetch details you are ready to paint the landing gear bays.

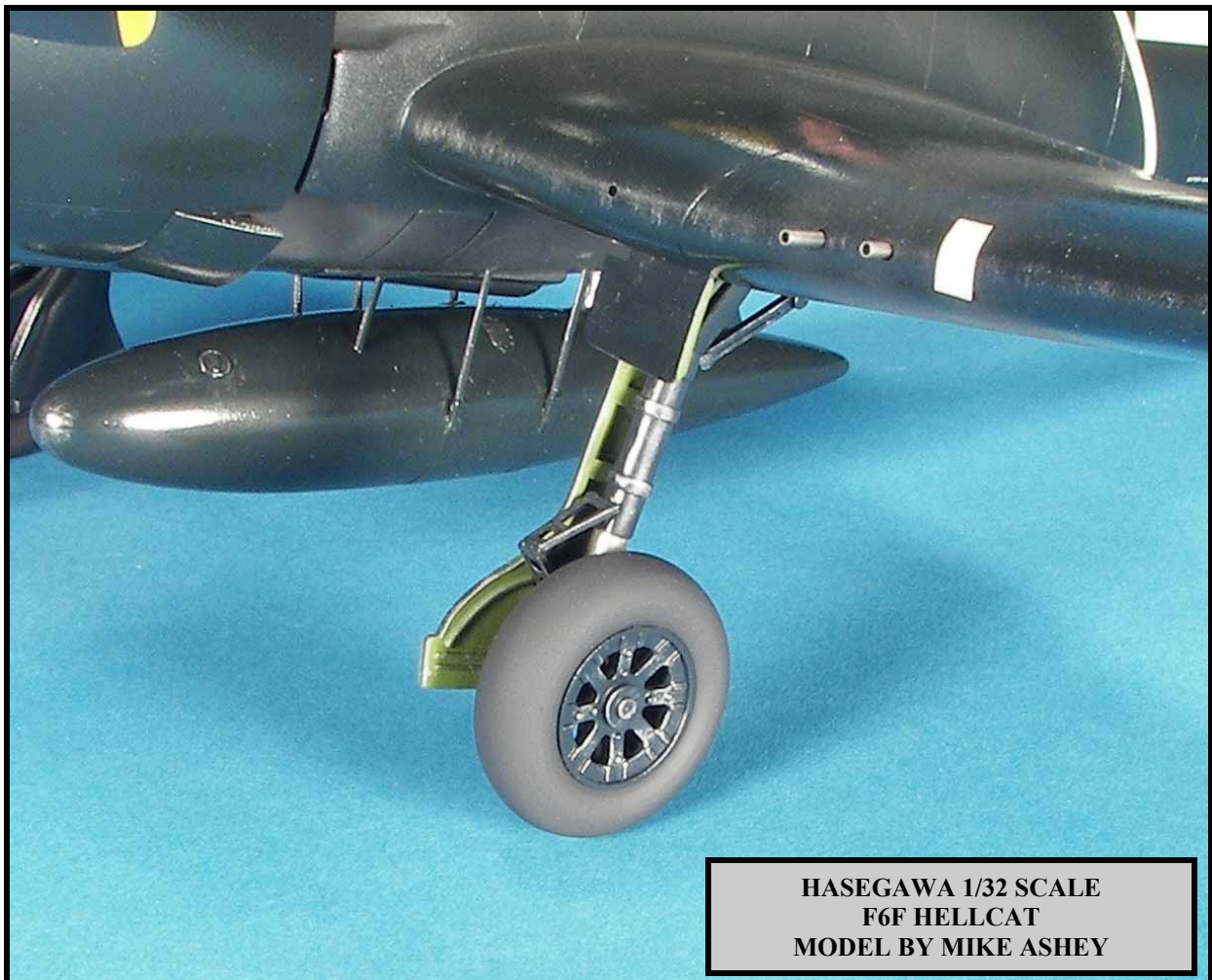
I like to paint the wing area first, then mask around the landing gear bay opening and paint it. I prime the landing gear bay and then paint it the required color. I almost always give landing gear bays a dusting of various colors of pastels dust using my trusty pastel pencils and a brush. I then seal the pastel dust with Testors Dullcoat.

The last step is to add any interior piping. You can use plastic rod, stiff wire or thin solder and if

you run several lengths close together make them different sizes. Whether you are running piping from front to back or left to right, I recommend that you pre-drill holes through the sides of the landing gear bay before assembling the wings. This gives a much more accurate representation of the piping and it also means that you do not have to be accurate in the lengths that you cut. Also be sure that you paint the lengths before you install them and if they are all the same color use different shades.

If the landing gear doors have no detail you can enhance their appearance by purchasing a photoetch detail set specifically designed for landing gear doors. Eduard markets hundreds of exterior detail sets for all types and scales and they typically include enhancements for the interior areas of the landing gear door such as framing.

If there are no detail sets available you can add some detail with strip stock. To add framing you will need to draw the locations of the strips onto the door and be sure that the outer framing that follows the perimeter of the door is slightly offset from the door's lip. Check your documentation for the approximate design of the framing and then duplicate it. Remember that it does not have to be exact; you just need to approximate the frame's appearance. After you have completed placing all the strips, paint the inner doors the correct interior color and then lightly weather them using pencil pastels.





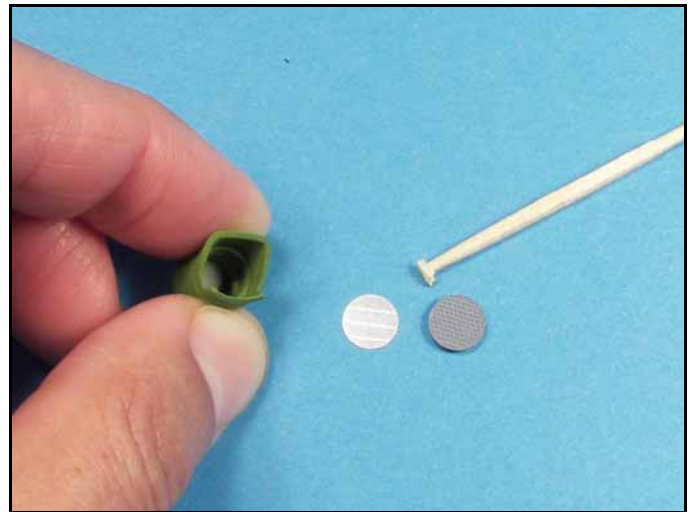
More and more kit manufacturers are including radial engines in their 1/32 scale kits which are models in themselves. Lay out the parts and clean them up. Don't forget to check the small parts for those pesky mold seams.



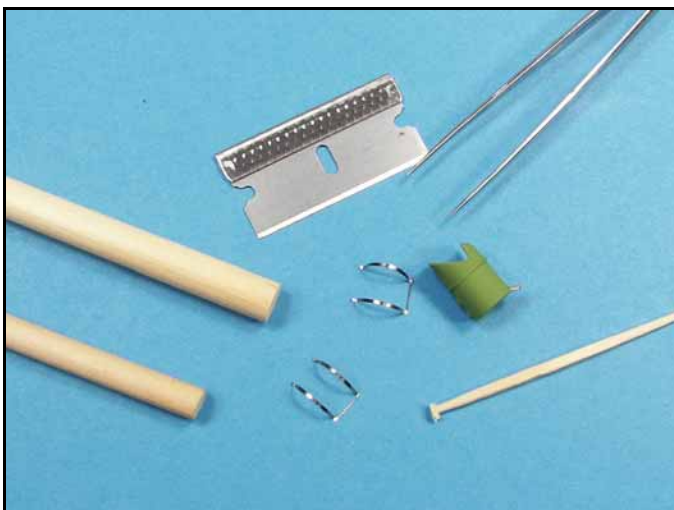
I carefully positioned and taped this engine bracket onto the firewall and added tiny drops of super glue. I removed the assembled part, added more glue and then painted it. Note the Eduard photoetch wiring harness clips.



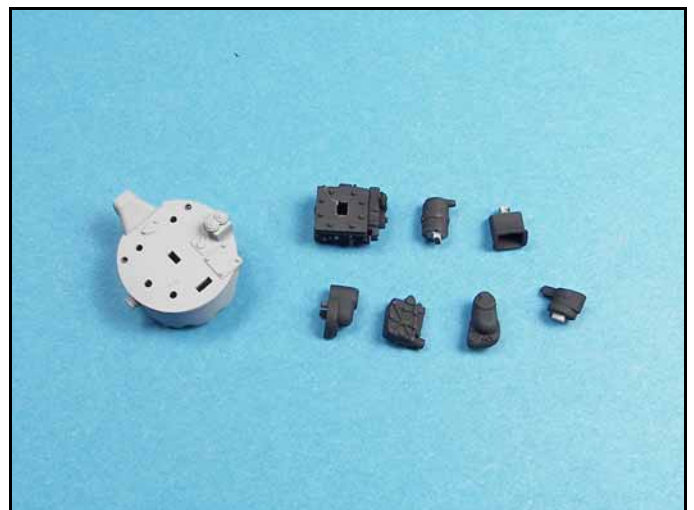
After I primed this part I found injection marks on its underside. Since I planned to display the area behind the engine I had to remove them.



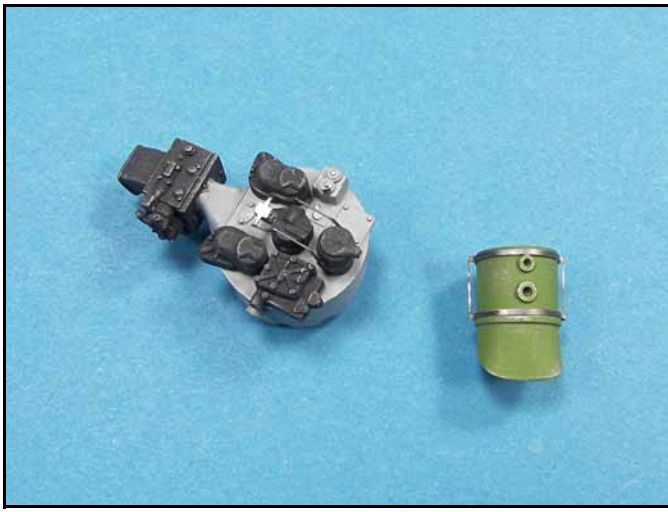
To insert the small Eduard photoetch screening inside the oil cooler housing I cut off the end of a round toothpick and placed a small strip of masking tape on the tip. This makes it easy to pick up the part and position it inside the housing.



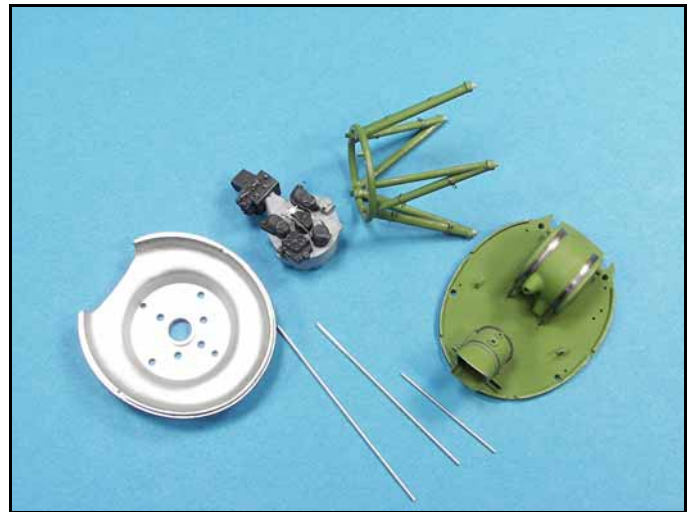
These photoetch brackets were shaped with wooden dowels. I used the larger one first to get the round shapes and then used the smaller dowel to tighten the curves so that they would fit snugly around the part.



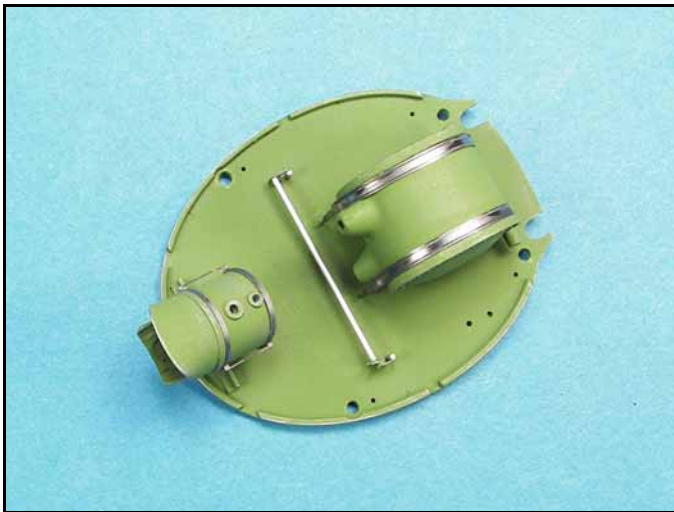
The parts that fit onto the backside of the engine were painted different shades of black so that they would stand out better.



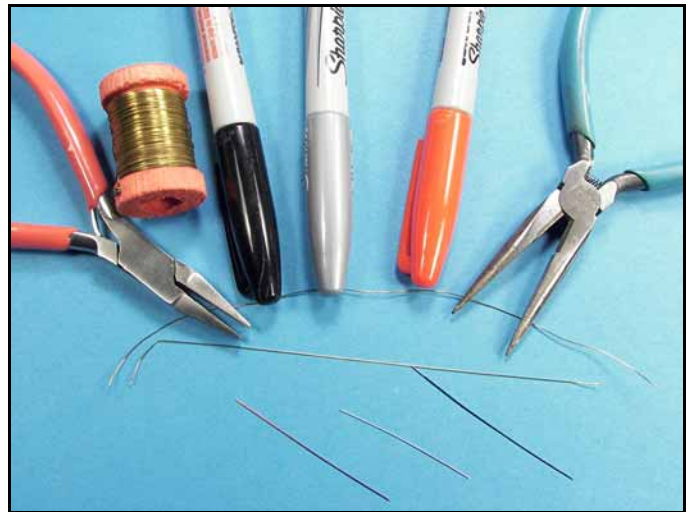
I drybrushed Testors silver paint onto the individual parts so that the corners and edges would stand out.



The subassemblies have their photoetch details added, the parts have been painted, drybrushed and assembled. Its now time to start adding some wiring and plumbing.



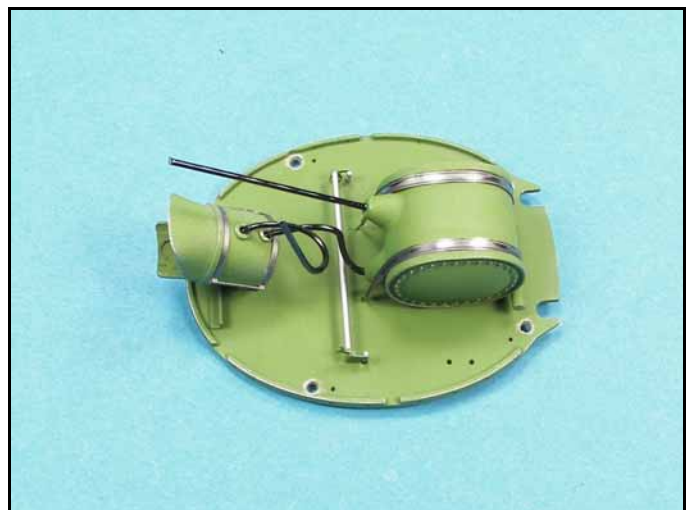
I predrilled the holes for the plumbing for the oil tank, the cooler and the engines control case.



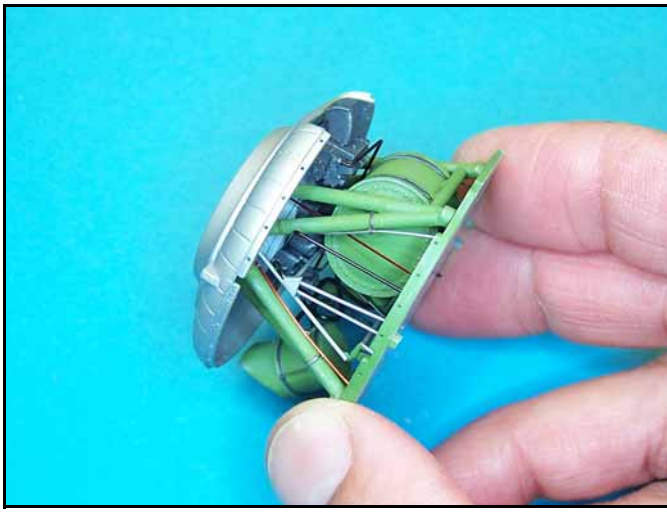
I used brass beading wires for the wiring details and I colored the wires using Sharpie markers. The individual wires were stretched out with flat nosed pliers.



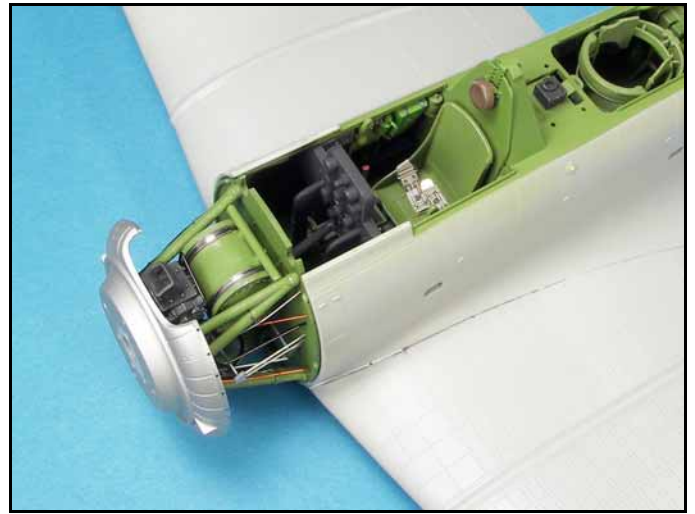
The engine control box and the engine brackets have been installed and I am now adding wiring.



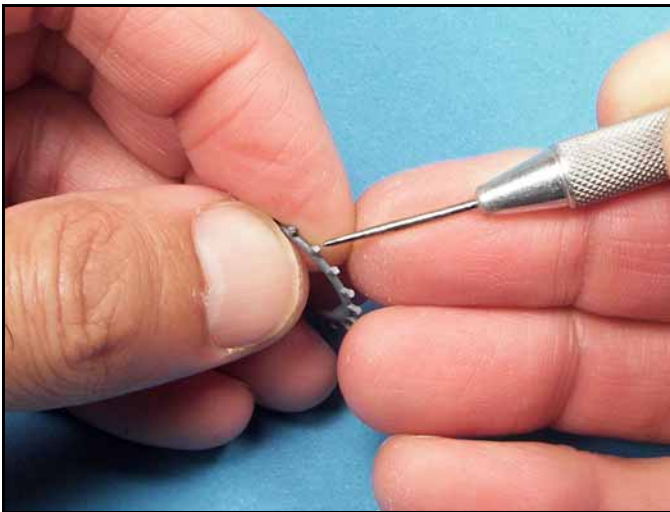
The oil plumbing was made from small diameter electronics solder painted with a black sharpie. Be sure to use solder that does not have flux. You don't want the flux leaking out from the solder onto the parts.



The firewall assembly is now complete including the throttle and engine mixture links. Note how clean the assembly looks.



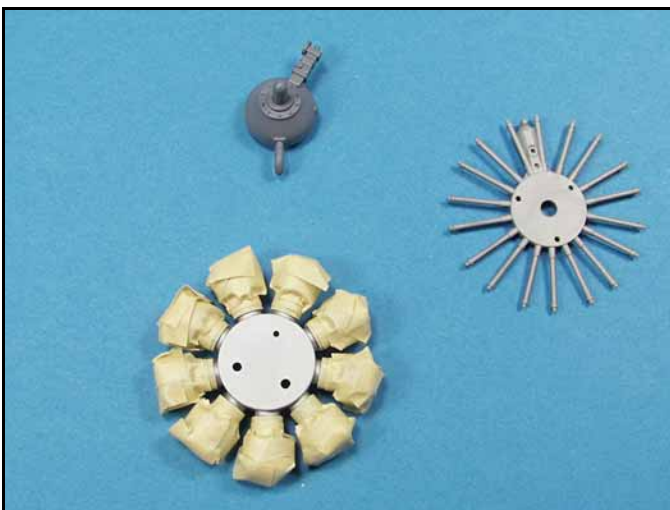
The assembly was then carefully positioned and glued to the fuselage. This model is now starting to look like an airplane!



To wire the engine I indented the tabs on the wiring harness so that the tip of my drill bit would not skip off to the edge. There is little room for error on these small parts.



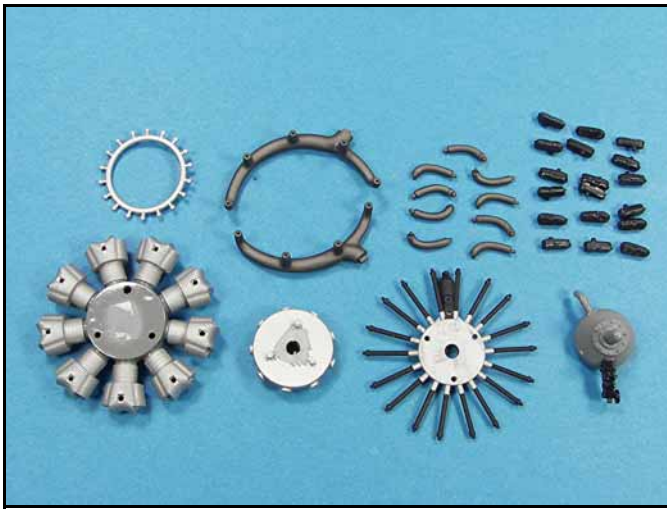
I used a number 79 (.0145 Inch) drill bit to drill tiny holes in the tabs so that the individual wiring for the spark plugs would have positive seating on the harness.



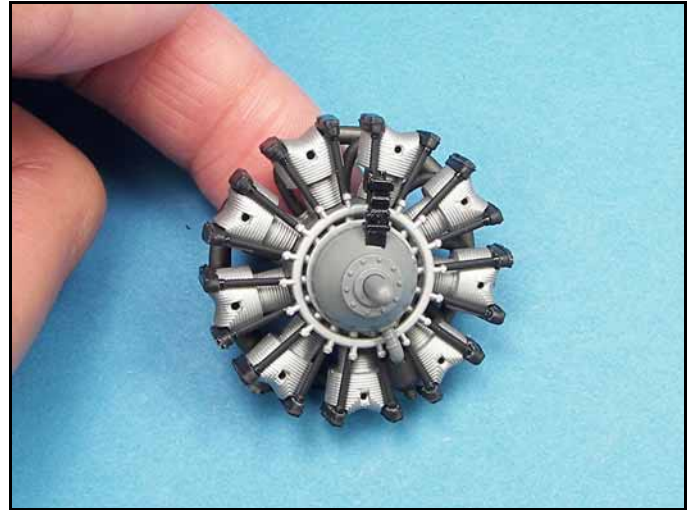
I painted the engine Testors steel buffing metalizer. I wrapped tiny strips of tape around the base of each cylinder and then used small square shapes to finish covering the cylinders. The base of the engine was painted gray.



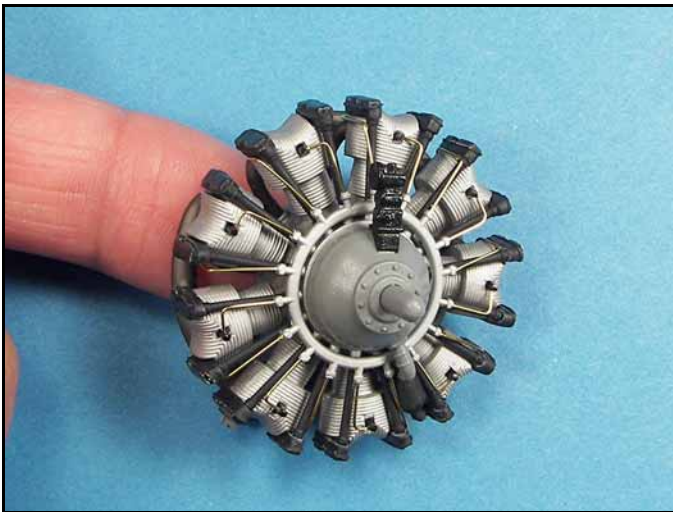
I used strips of balsa wood taped together to elevate the engine parts for drying. The wood stems allowed me to handle the parts and paint them in one airbrush session.



All the engine subassemblies have been painted. Note the clean demarcation lines between the black and silver colors on the push rods. This was achieved with careful masking.



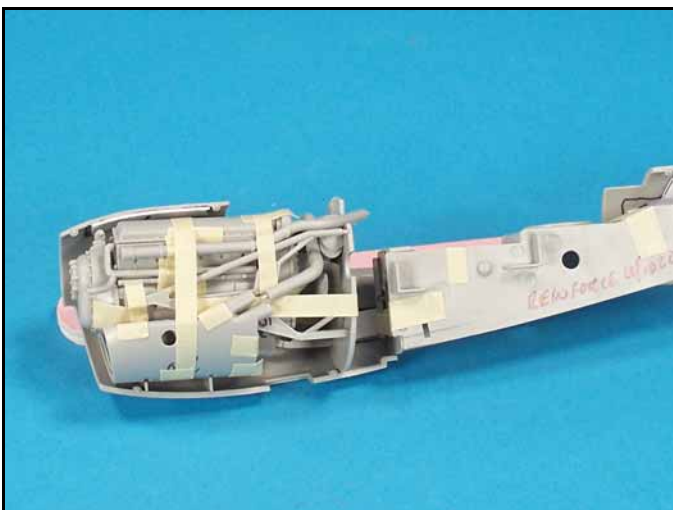
The engine is now assembled and the last step is to add the spark plug wiring. Note how all the different colors add depth to the assembly.



Brass beading wire was used for the spark plug wires. Each length was stretched straight and then form fitted into place. The wires were attached to the wiring harness with drops of super glue.



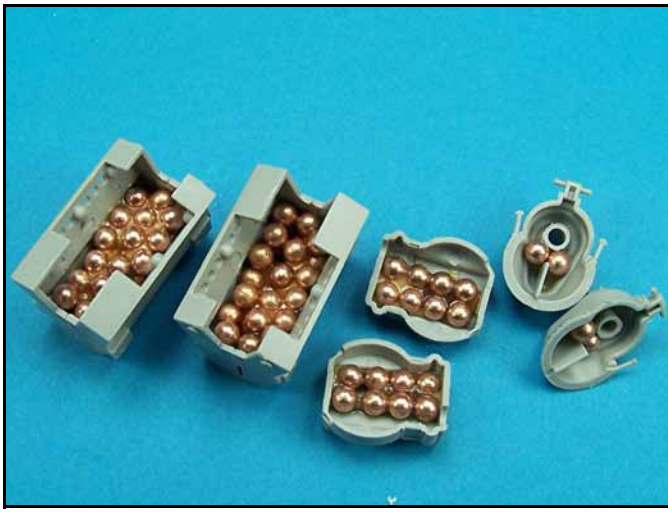
This engine sure looks good enclosed inside the bright red cowling. Since so much of the surface of a radial engine can be seen, careful painting and adding details such as wiring can really make them stand out.



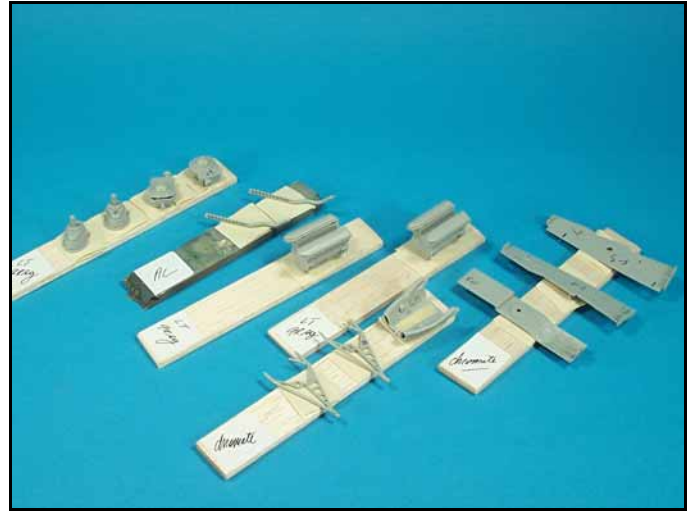
In line piston engines can't be seen unless you plan to remove access panels. I assembled this 1/32 scale P-38 engine to check the fit inside its tight fuselage location.



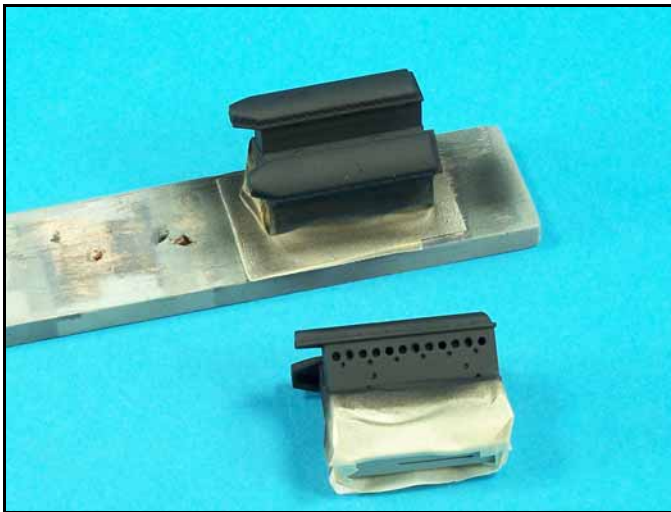
The engine air scoop vents for the P-38 needed a little work to properly close the seam lines. I used strips of plastic to accomplish this.



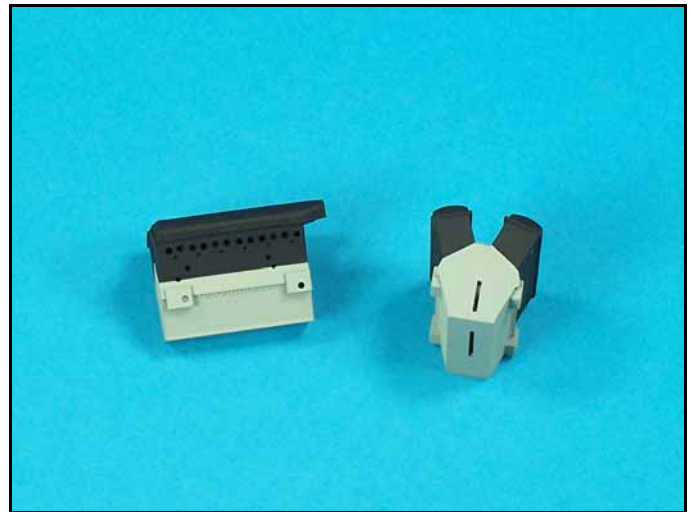
To get a P-38 to sit correctly you need to add weight where ever you can. I added brass bee bees to the inside of the engines and glued them in place with white glue.



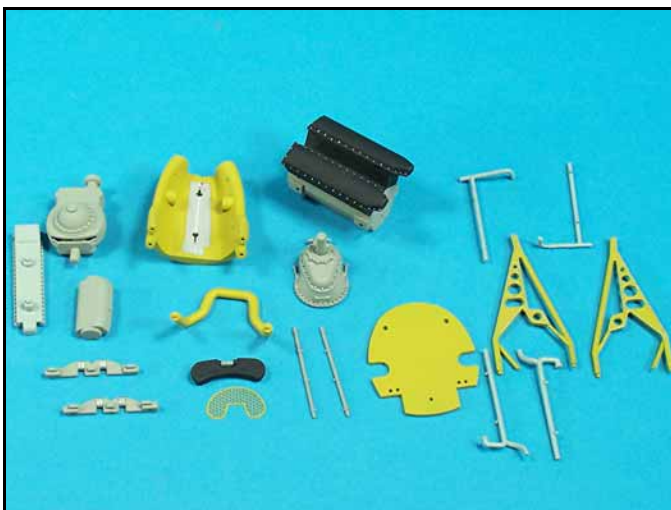
Now that all the sub-assemblies are complete its time to start painting.



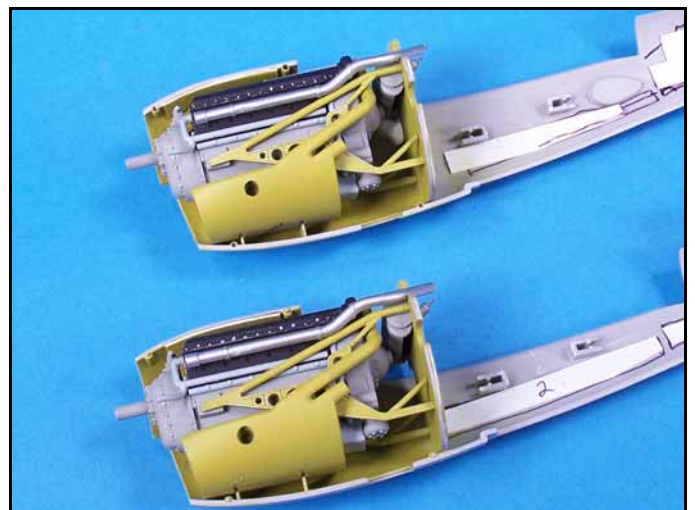
The engine blocks on the P-38 were painted gray, then masked so that the upper halves could be painted flat black.



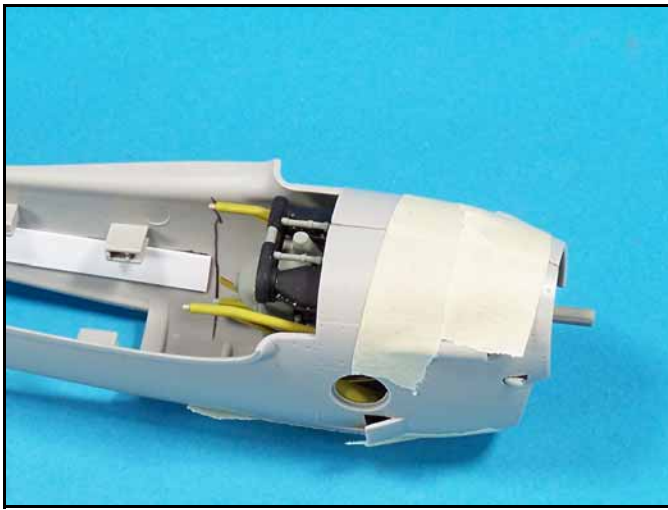
Note the fine demarcation lines between the gray and the black. Always cut masking tape with a sharp blade to get fine paint edges.



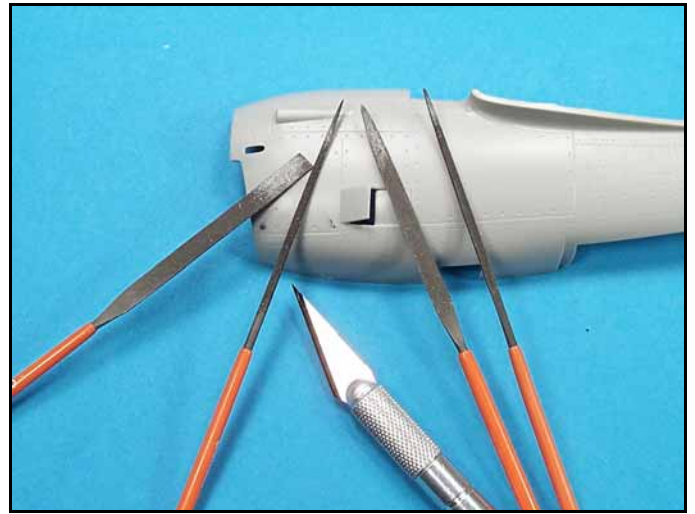
All the P-38 engine sub-assemblies have been painted and drybrushed and now it time to assemble them Be sure to scrape off the paint at the glue locations so that you get a strong bond.



The engines have been assembled and attached to their firewalls. They are now getting a final fit check. Note the strips of white plastic laminated to the inside areas of the fuselage to add strength to the assembled parts.



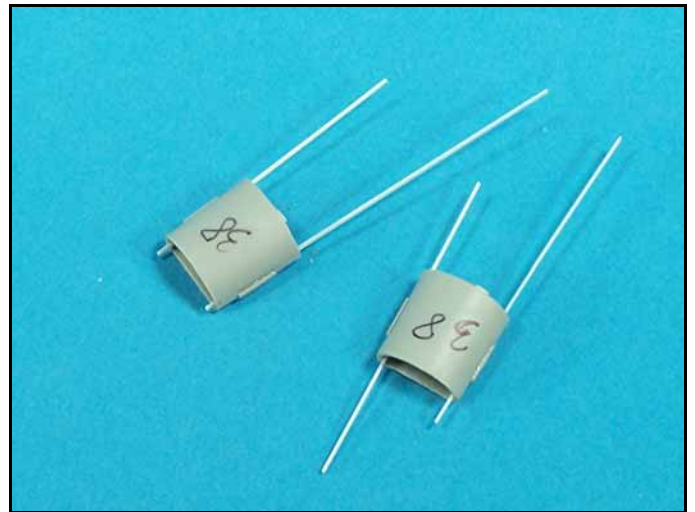
P-38's in any scale have lots of seams to work on. I taped the parts together as tightly as possible and there was still slight voids between the fuselage halves.



I used micro files and the tip of my trusty number 11 blade to clean up and shape the openings on the sides of the boom fuselages on this P-38 project. Files remove a lot of plastic very quickly so go slow and check your work frequently.



The air intakes on the fuselage booms were multiple piece assemblies and they had lots of seams to fix.



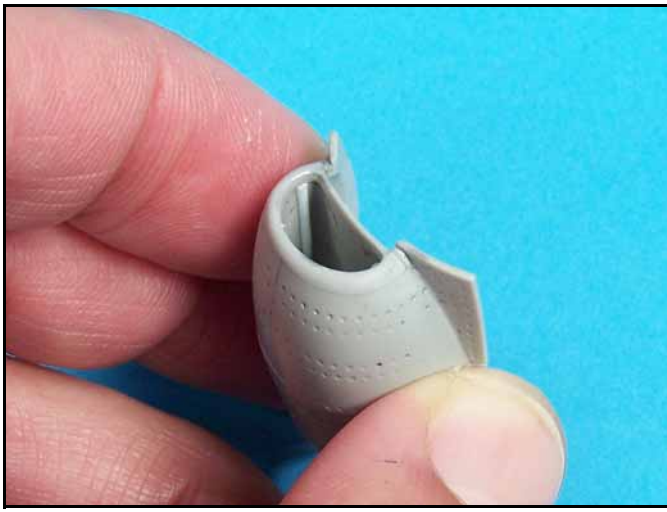
The inside air intake assemblies had seams that were impossible to get to so I used small half diameter lengths of plastic strip to hide them



The air intakes required a lot of super glue to fill the seams. I then carefully scraped the glue flat and then sand the surfaces.



I polished the plastic with 0000 steel wool and the restored the rivet detail.



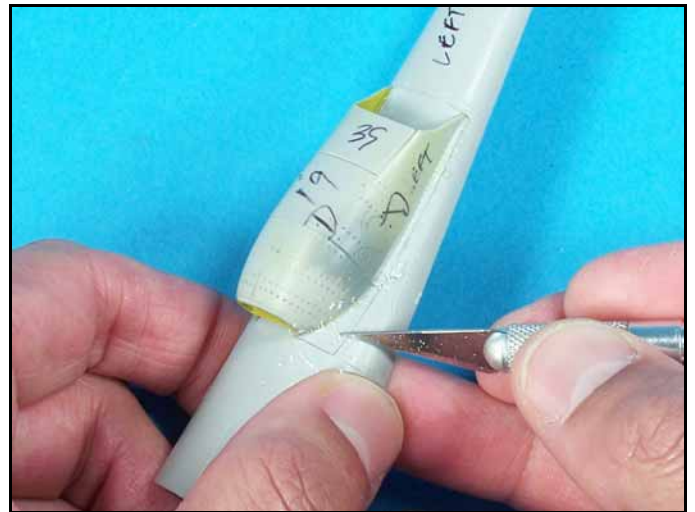
Note how the small diameter half rounds hide the interior seam. Once the part is painted you will not notice the added length of plastic.



After I finished the seam work on the P-38 air intake assemblies I added the photoetch screening.



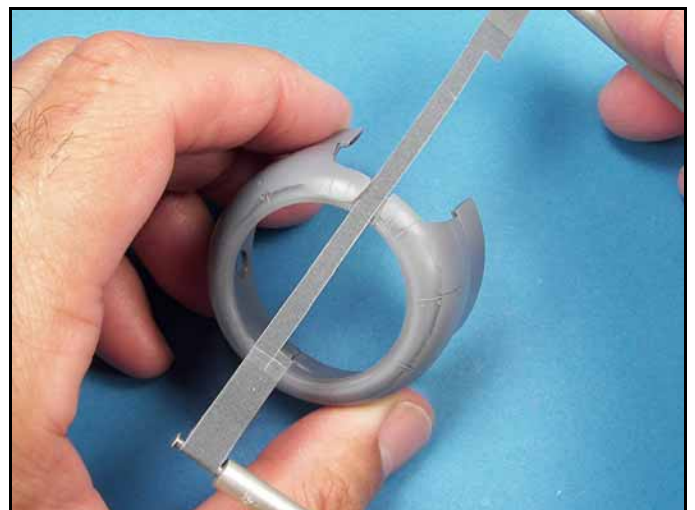
The air intakes were then super glued to the boom fuselages and the seam lines were filled with super glue applied with a thin wire applicator.



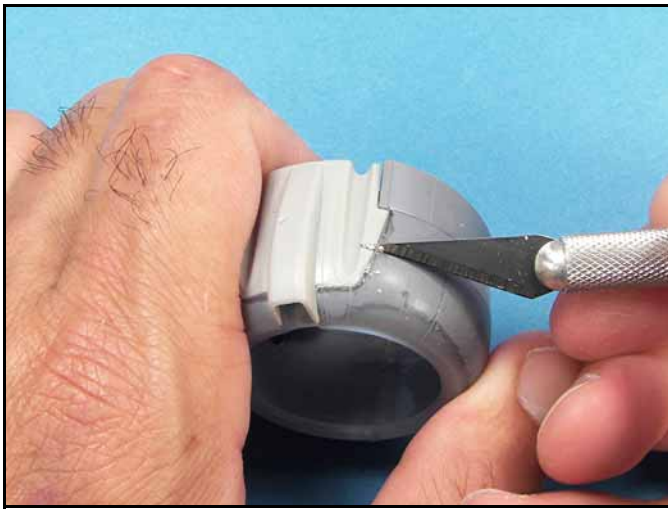
The seams were carefully scraped to remove the excess glue, and the surfaces were sanded smooth. I had to repeat this process several times before the seam lines disappeared.



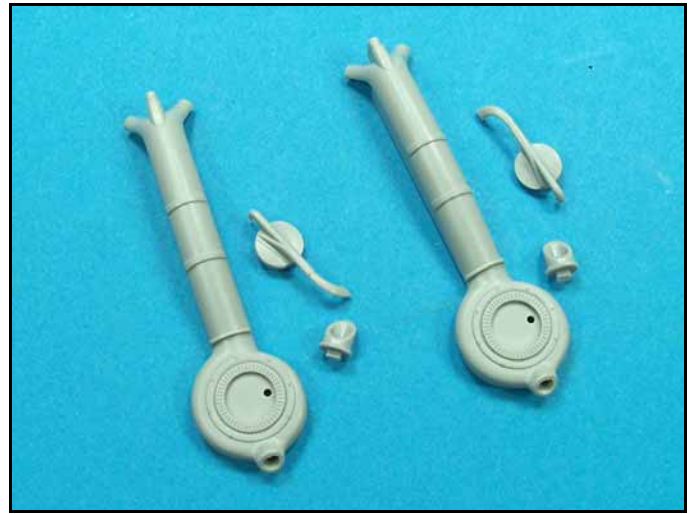
The assembly on this SBD cowling required some sanding and scraping to get the parts to fit correctly.



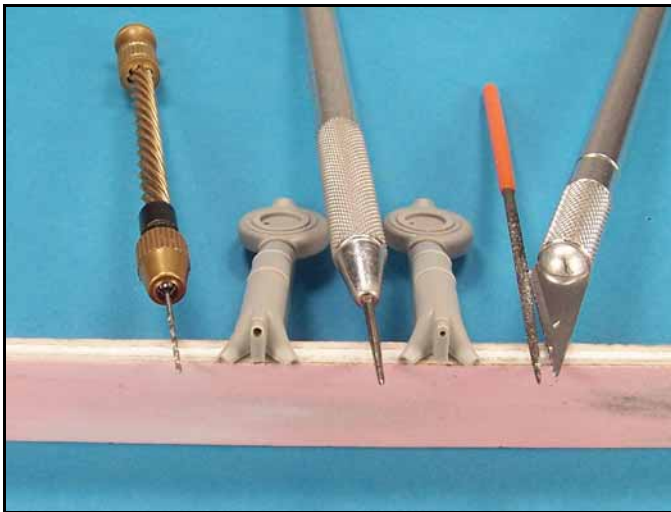
To get to the seam in the indented area of this SBD cowling, I reduced the width of the Flex-I-File sandpaper strip.



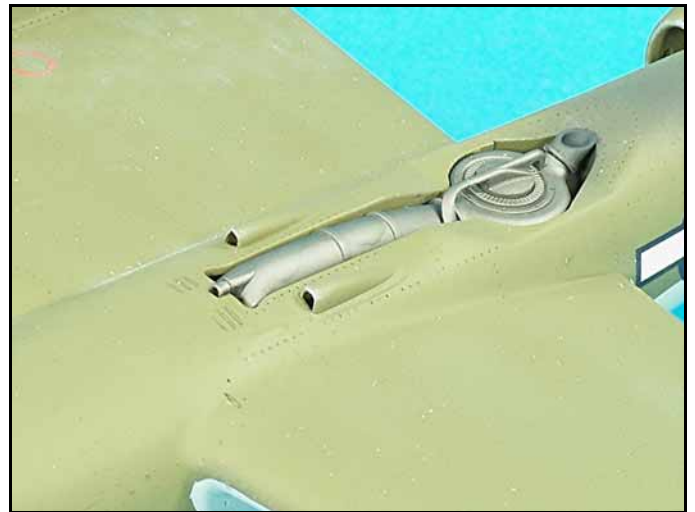
Layers of super glue were added with a thin wire applicator to fill the seam line. I then carefully scraped the seam smooth, lightly sand the surface and then polished the plastic with 0000 steel wool.



Although the P-38 superchargers were several parts and well detailed one additional touch was needed.



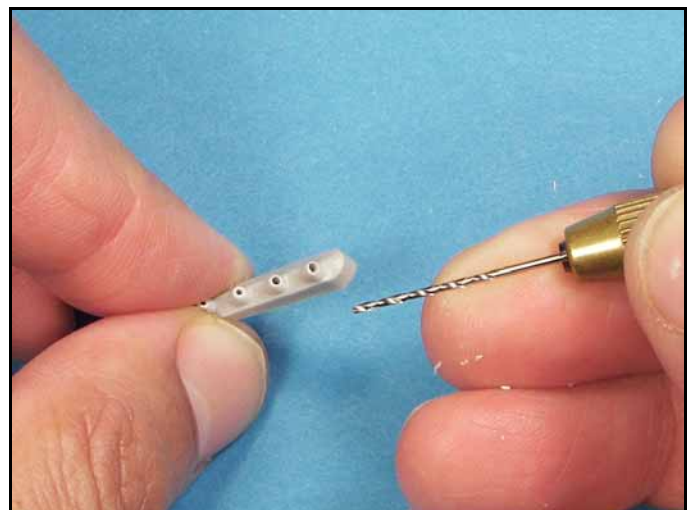
The air cooling inlets needed to be drilled out. I started with a pilot hole and carefully enlarged it. Note how thin the plastic walls are around the hole.



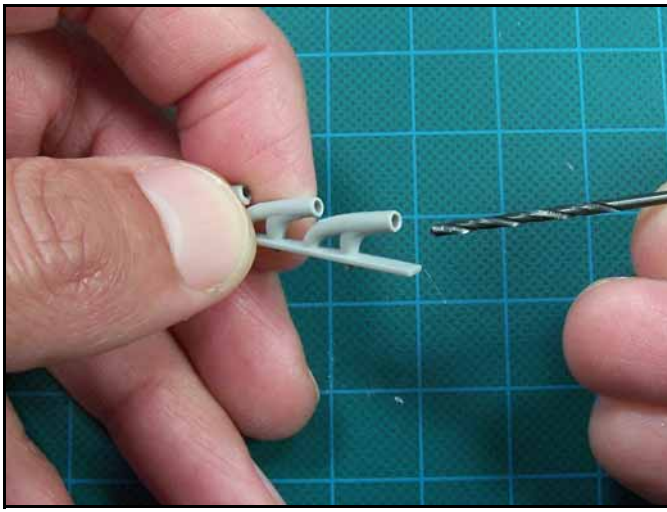
The supercharger was painted with Testors metalizer buffing exhaust and burnt metal colors and then polished with a Q-Tip.



The exhaust pipes for this Mig -3 kit were well shaped but they had prominent mold lines that needed to be removed.



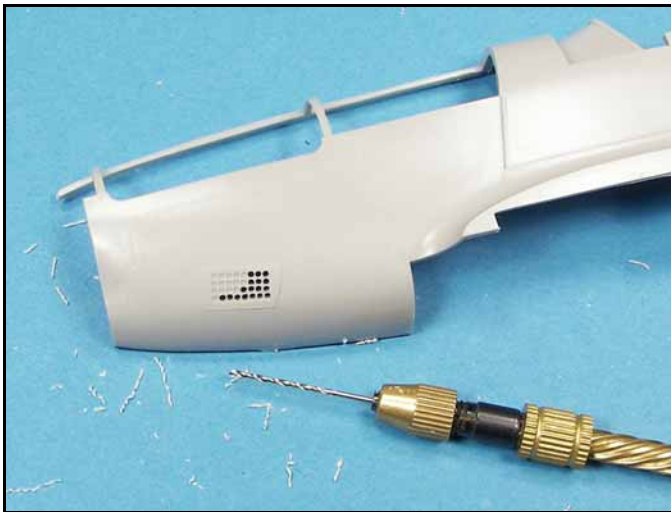
The exhaust ports on this Mustang engine manifold were drilled out by hand.



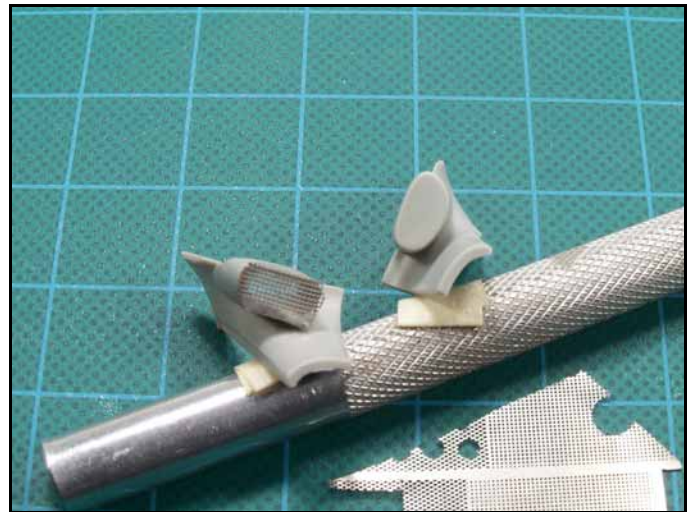
Note how thin the walls are on the Mig-3 engine exhausts. If I had scraped the mold lines off after I drilled out the exhausts I might have collapsed a wall. Do all the scraping, sanding and shaping before you drill.



Another good example of drilled out exhausts. By using lots of drill bits with tiny changes in bit diameter you can achieve very thin plastic walls on exhausts.



The engine breather holes on the fuselage of this P-51 Mustang were carefully drilled out. The molded on indentations for the holes were perfect for guiding the tip of the drill bit.



The engine intakes on these Mig-3 parts had molded on screening. I drilled out the plastic and replaced it with photoetch screening.



The air intakes look much better with actual screening. Small touches like adding screening and drilling out the exhausts add higher levels of visual realism to a scale model.



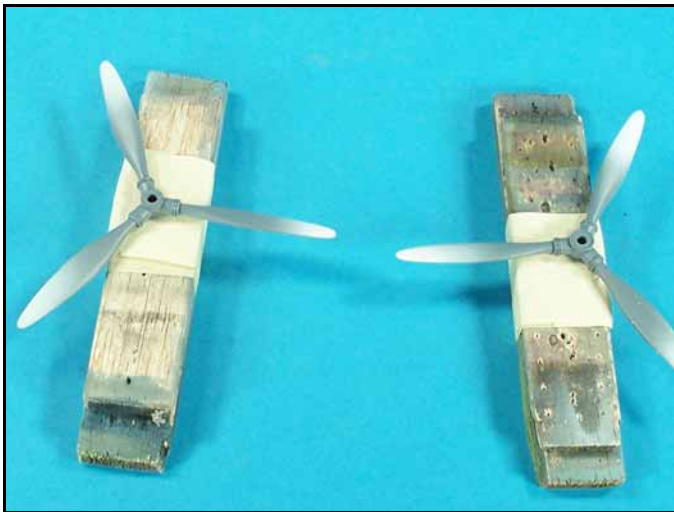
These Revell P-38 props had dimples that were easily filled by super gluing tiny strips of plastic over the dimples. I used the Revell props instead of the Trumpeter kit props because the Revell parts had a more accurate shape.



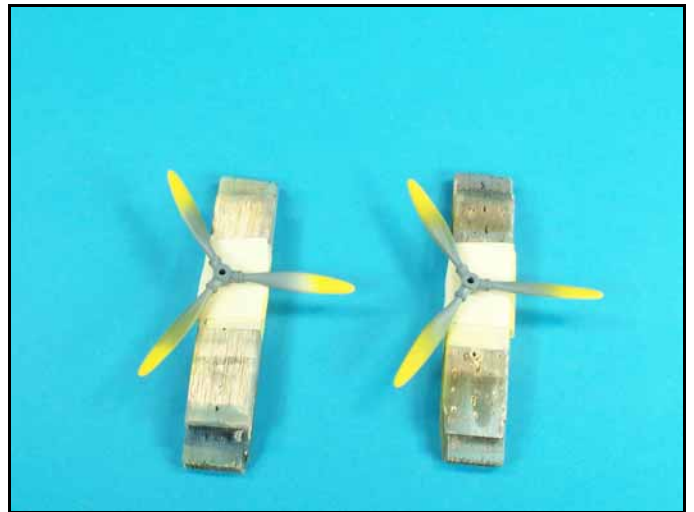
The first step in achieving good looking propellers is to carefully snip off the tree attachment points, and then sanding the area smooth with a sanding stick.



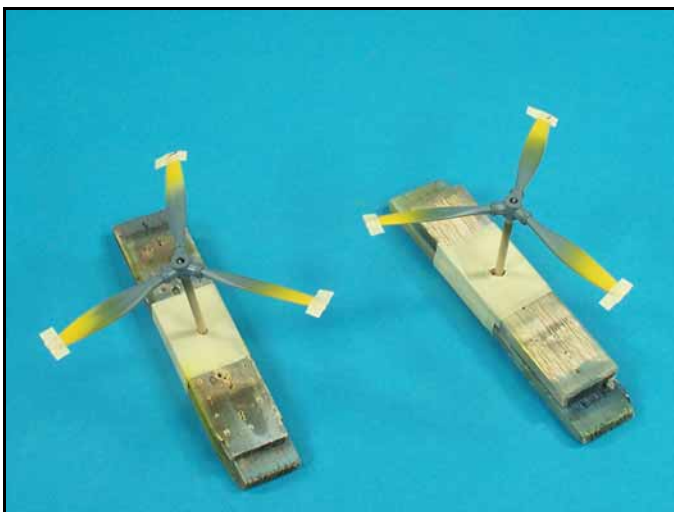
The edges of the blades sometimes have mold lines that need to be scraped off. Finish the props by wet sanding the surfaces with a sanding stick



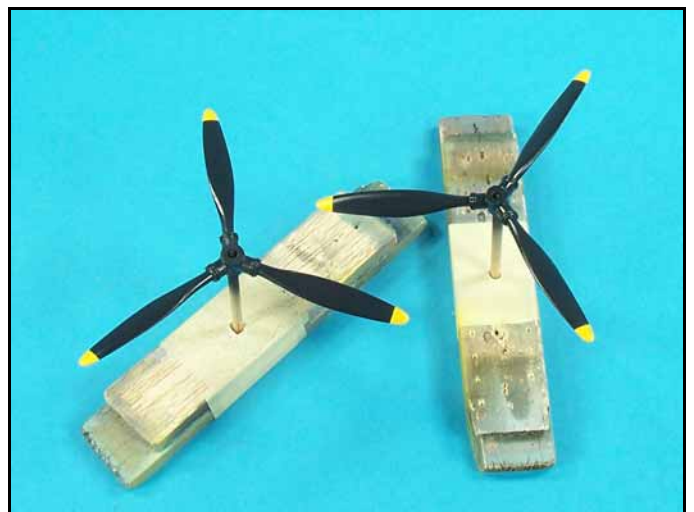
Prime the props and then airbrush the tips flat white.



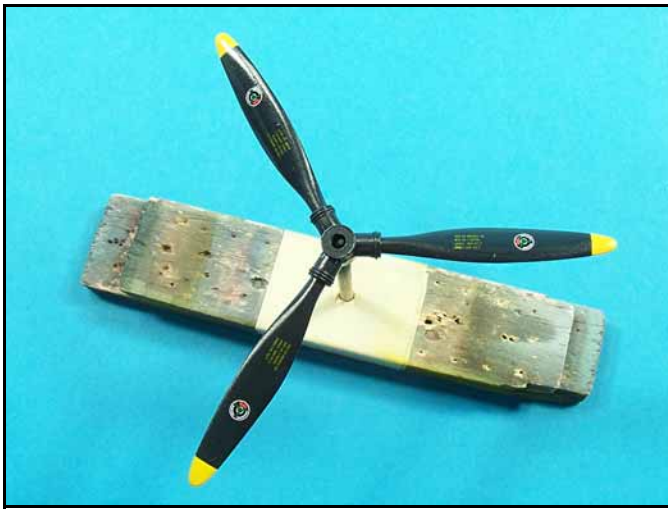
Next airbrush the color for the propeller tips. Usually it was a bright color so the ground crews knew where the edges of the props were when the engine was running.



Carefully mask the tips using small strips of masking tape cut with a straight edge and a sharp blade.



The remaining areas of the props were painted flat black and then given a coat of clear gloss for the decals.



The clear gloss surface will prevent silvering of the clear decal backing and also make it easy to slide the decals around a little to get them positioned correctly. Be sure the decals are positioned on the blades in the same locations.



The props are then given a coat of Testors clear flat. Note how the Black color is now a lighter shade.



The combination of part preparation, color undercoating, careful masking and proper decal application technique will give you great looking propellers.



When I test fitted these props on the P-38, I noticed that they sat slightly below their correct locations. The props needed to be positioned a tad bit higher.



To fix this problem I glued a tiny strip of plastic on the engine shaft to raise the propellers. I test fitted the props and carefully sanded down the plastic until the props sat correctly.



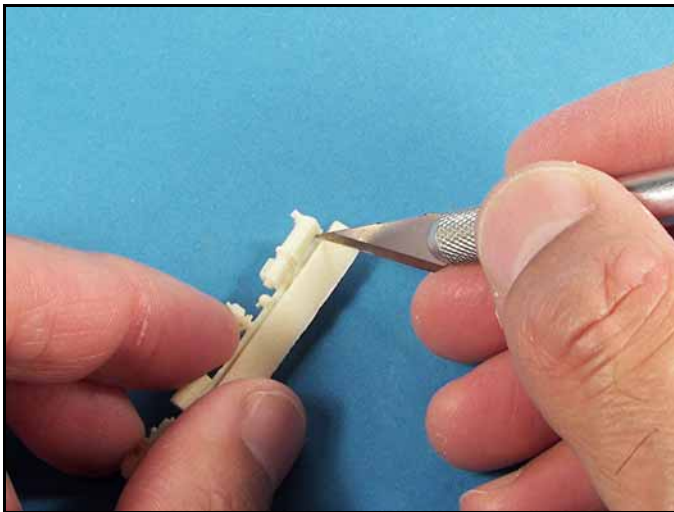
The propeller assemblies look much better now that they have been positioned correctly!



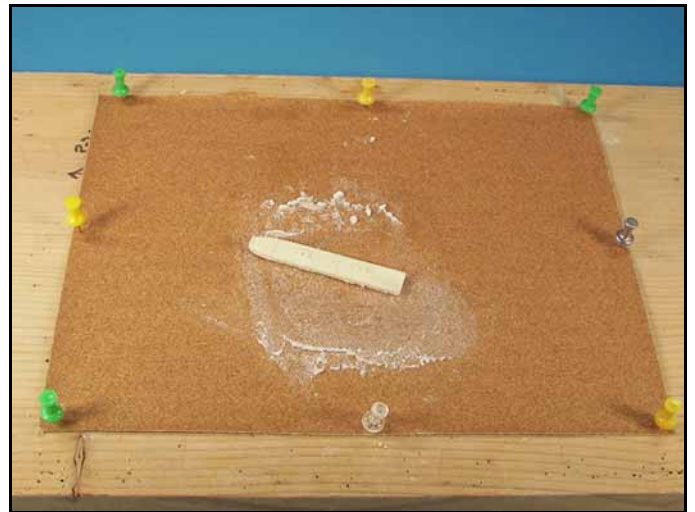
While some kits come with jet engines, resin castings are usually better detailed. This detail set is for Revell's 1/32 scale He-162 salamander.



The pour plugs are best removed with a razor saw. The remaining plug can be wet sanded. Wear a dust mask when working with dry resin to prevent inhaling the dust.



Small parts can be removed from their pour plugs using the tip of a number 11 X-Acto blade. Carefully scrape and sand the parts smooth at the pour plug connection points.



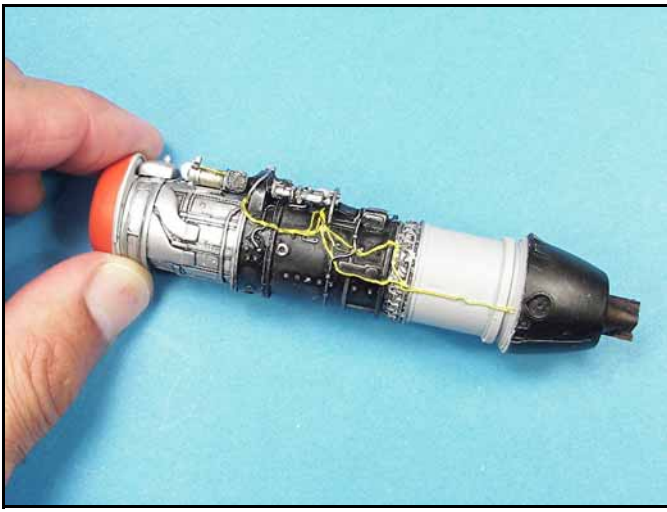
I like to wet sand resin on a stationary piece of sandpaper. To remove the excess resin evenly, use a figure eight motion and don't press too hard as resin responds quickly to sandpaper.



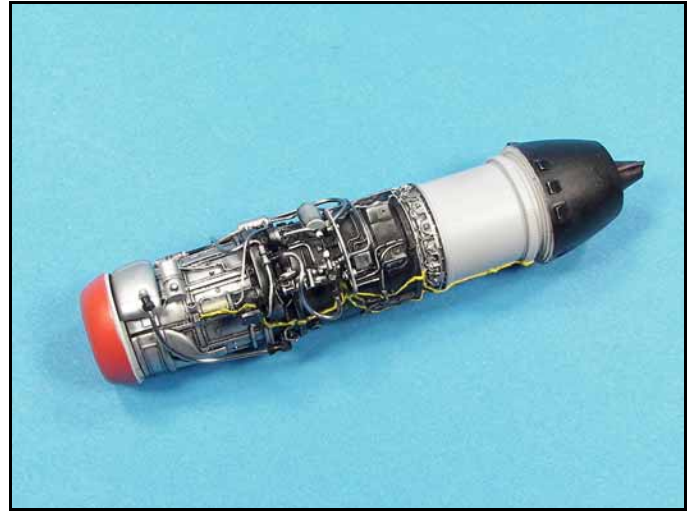
The kit engine looks good, but the three part resin engine has a lot more surface detail. Model by Scott Weller



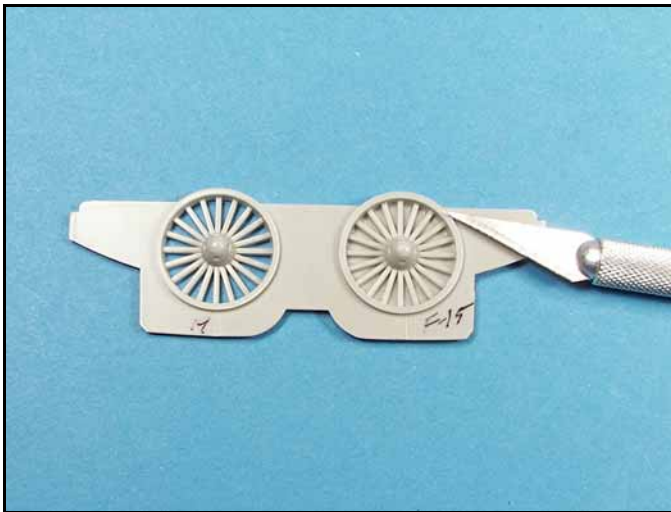
Extra surface details were added using fine electronics wire and small diameter solder. You can also use Rub & Buff to highlight details. Model by Scott Weller.



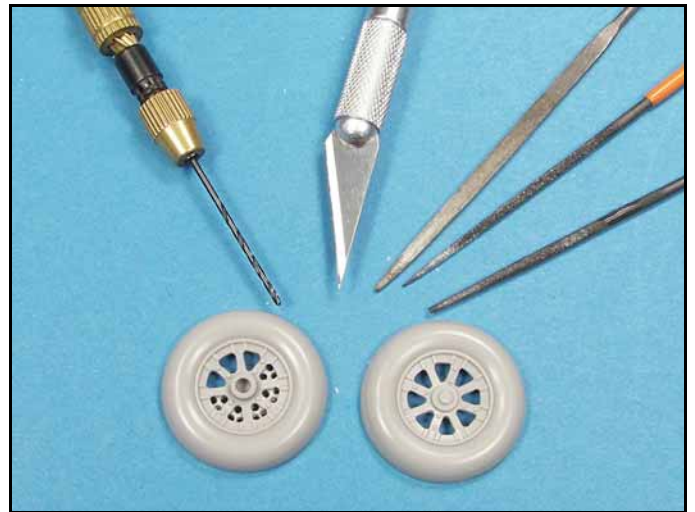
Note how the clean paint job and multiple colors add to the busy look of the engine. Model by Scott Weller.



Dry brushing and Rub & Buff are excellent paints for bringing out small details by highlighting the edges of these small parts. Model by Scott Weller.



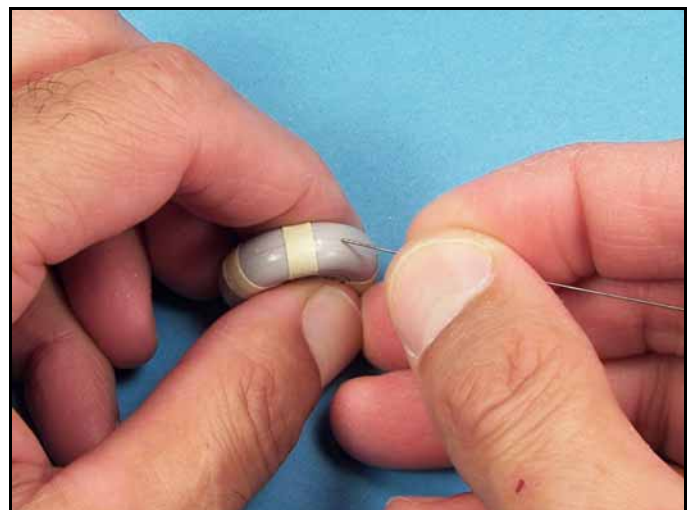
To enhance jet engine intakes sand off the backing and then carefully remove the thin plastic from between the blades. Form fit a piece of plastic behind the part and paint it black to add some depth to the intake.



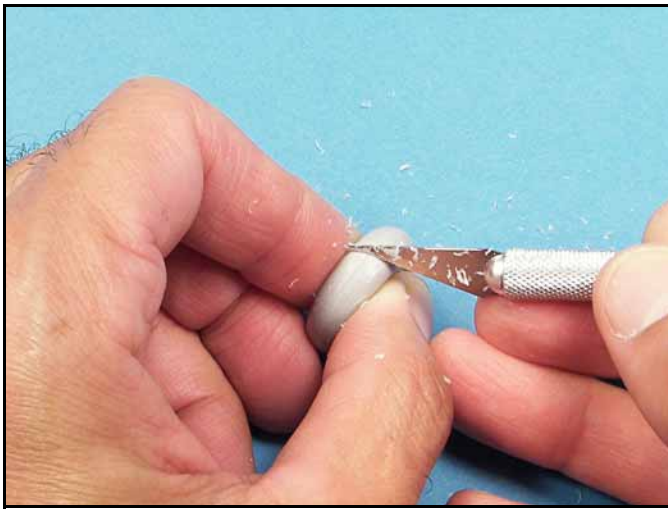
Wheels can be enhanced by removing the plastic from between the spokes.



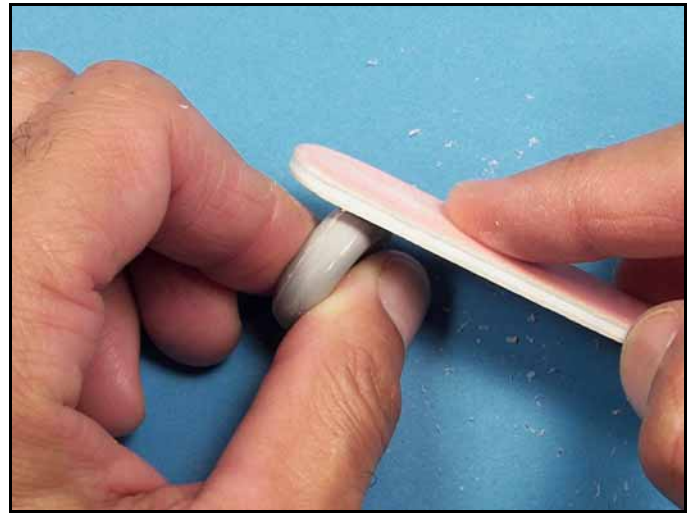
Flatten out the gluing surfaces for a tight fit. Just a few passes across the sandpaper will do the trick.



Tape the parts together tightly and then run a bead of super glue around the seam. Be sure to line up the spokes prior to taping and gluing.



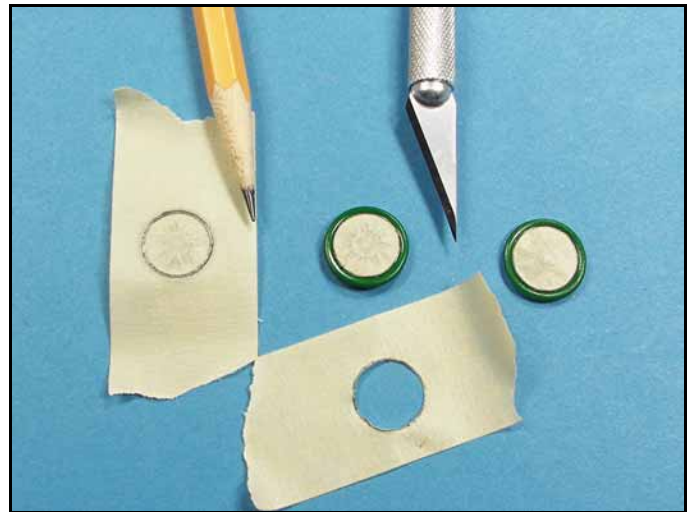
Lightly scrape the excess super glue off the seam line. Holding the blade at an approximate 45 degree angle will prevent the blade from digging into the surface of the plastic as you scrape.



Use a sanding stick to smooth out the surface of the plastic. To get a finer surface finish wet sand the plastic.



The final plastic surface preparation for plastic tires is to polish the plastic with 0000 steel wool.



To mask the hubs place masking tape over them and press down along the rim with a soft pencil. Use the tip of your trusty number 11 X-Acto blade to cut along the pencil line using the rim as a guide for the blades tip.



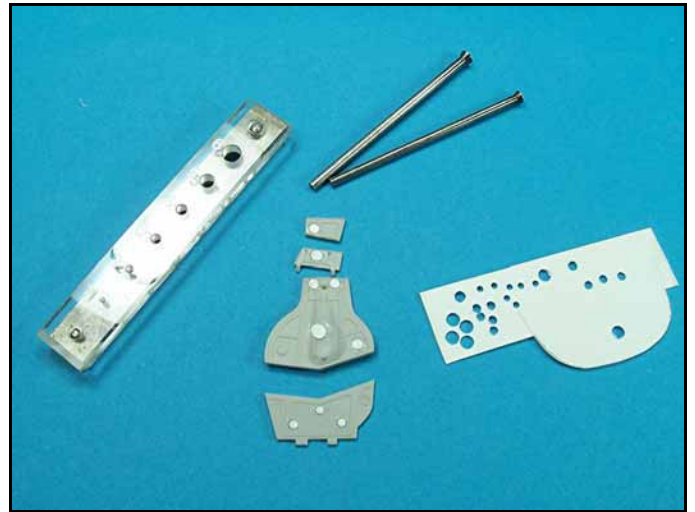
On small wheels I sometimes use indelible markers to paint the tire and thin tipped markers to paint around the tire/rim contact area.



Kit manufacturers are providing separate tires and rims in either plastic or some type of flexible material. The flexible material has a tendency to be a dust magnet. Assemble the wheels and use masking tape to remove the dust.



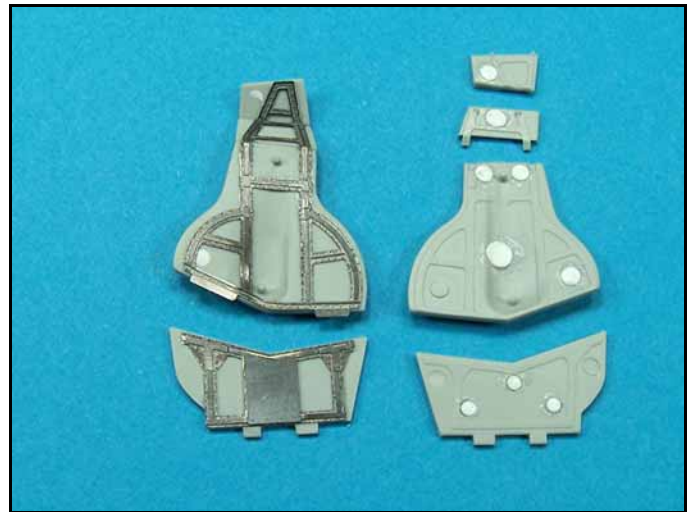
I immediately airbrush the wheels with Testors clear flat which seals the flexible material and prevents dust from clinging to it.



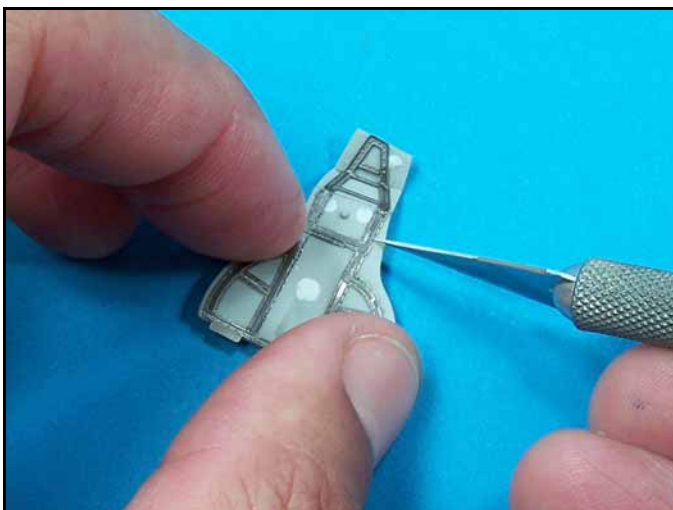
Landing gear doors sometimes have either raised or indented circular injection marks. Raised ones can be scrapped off and indented ones can be filled by making disks from your Waldron Punch tool



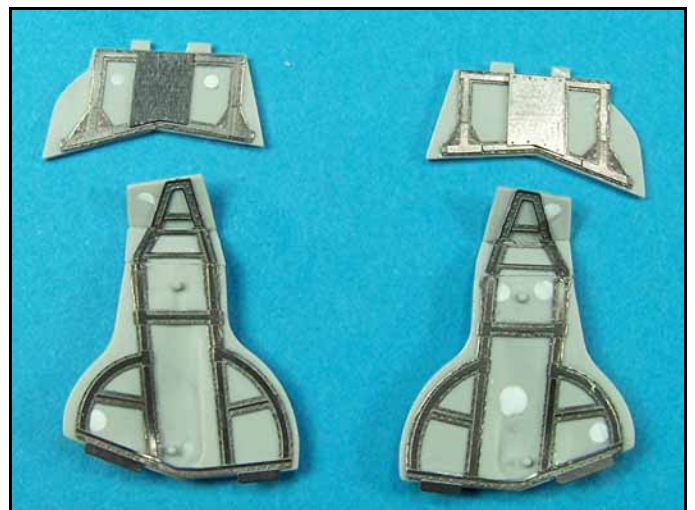
Super glue the disks in place and then smooth them out with sandpaper strips wrapped around sections of balsa wood.



To enhance the inner doors on these Mig-3 parts I used Eduard photoetch details. I positioned each part and then ran beads of super glue around the edges.



To remove the excess super glue I carefully scraped off the glue with a sharp number 11 X-Acto blade.



Once these parts are painted the raised framing and rivet details will really stand out, helping to enhance the overall effect of realism on the landing gear.



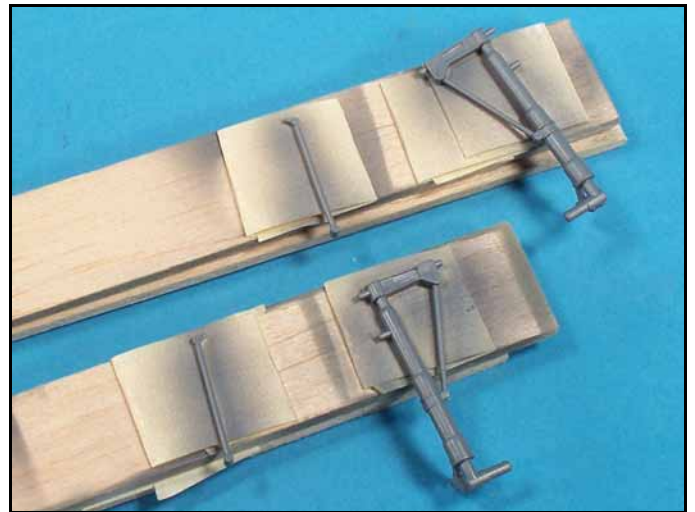
To fix the injection indentations on these Hasegawa Hellcat landing gear, I drilled the indentation deeper and the super glued plastic rod. The rods were then cut and carefully sanded smooth with a Flex-I-File.



Even new kits suffer from these pesky injection marks. These Trumpeter P-38 landing gear had small indentations that were filled in the same way as the older Hasegawa kit parts were.



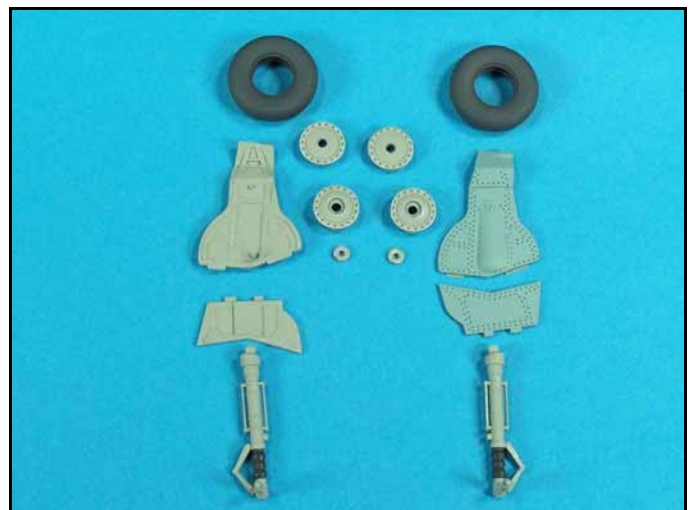
I always polish the surfaces of the plastic with 0000 steel wool to remove any scratches from the scraping and sanding process. Don't forget to remove the mold lines on these parts!



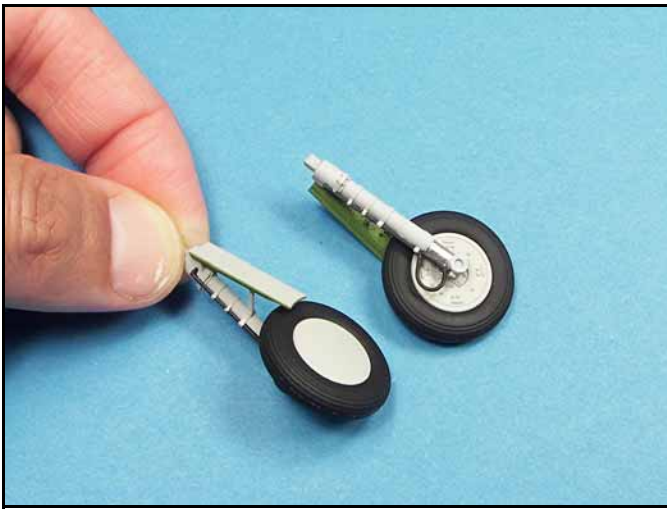
Priming these small parts is essential. The primer will enhance any flaws that you may have missed.



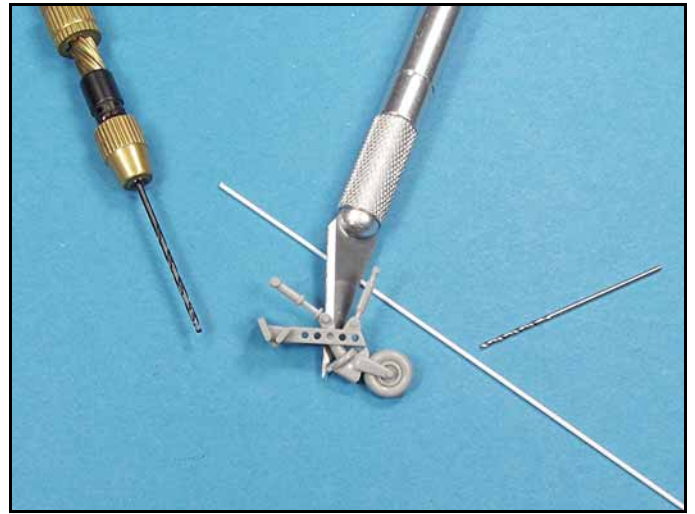
Many newer kits come with the brake lines molded onto the landing gear or as separate parts. Carefully paint the brake lines with a detail brush. I use Testors chrome color to paint the oleo's.



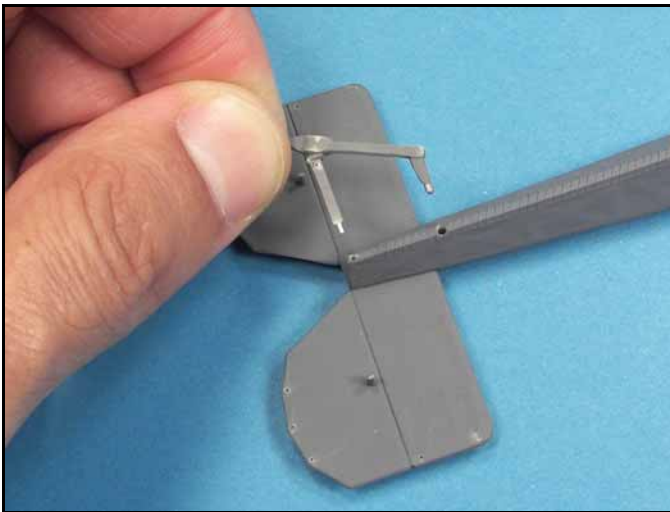
These Mig-3 landing gear parts have been painted and details and they are now ready for assembly. Note how clean all the parts look. There are no glue or paint smears.



These SBD landing gear have been full assembled and they are ready for installation. The attachment points for the landing gear were pre-fitted so that once assembled they would slide into place.



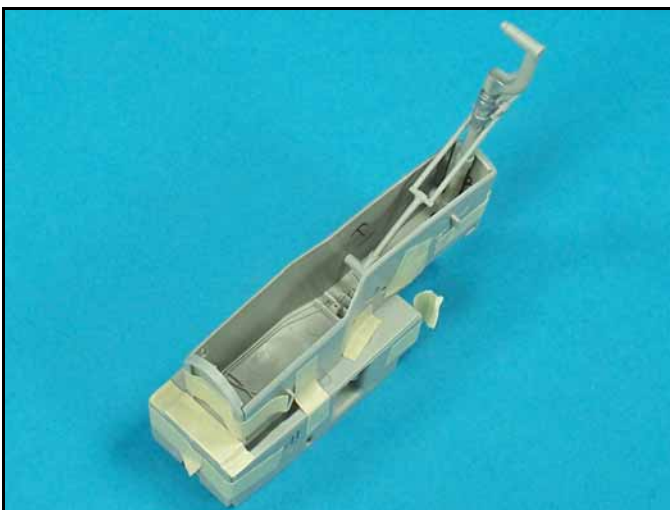
This tail wheel was enhanced by removing the mold lines, drilling out the dimple and filling it with round stock and then drilling out the framing.



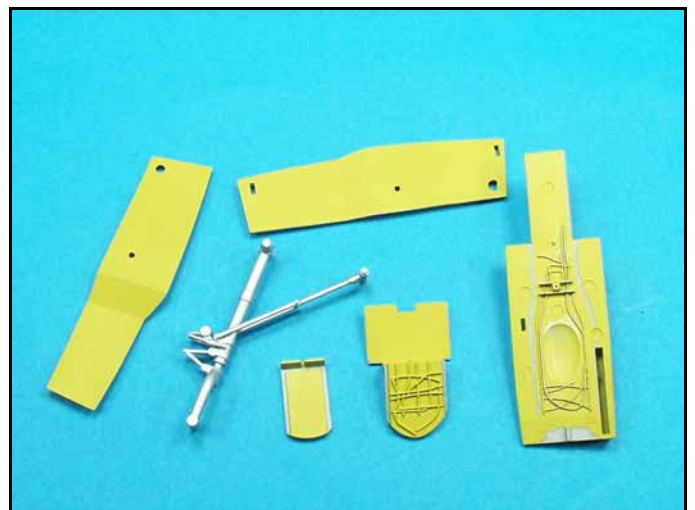
The tail skid on this old Bi-Plane kit needed an additional attachment point to make the part more secure. I drilled out a tiny hole, added some round stock and then drilled a corresponding hole in the fuselage.



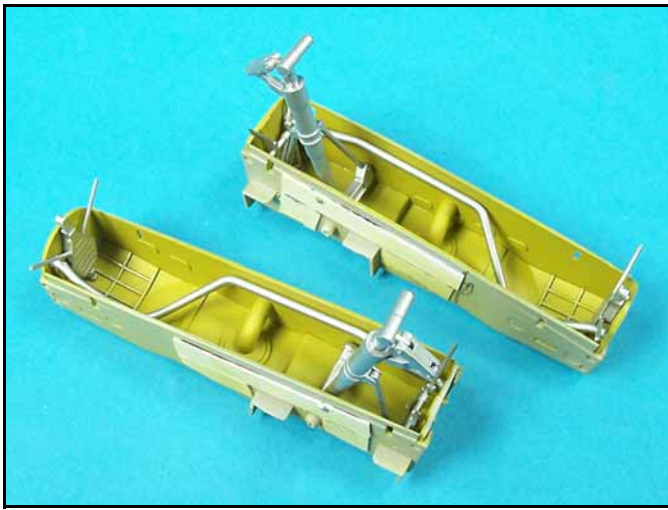
These tail wheel parts were carefully painted and weathered using pencil pastels. Note the fine demarcation line between the gray metal color and black color of the oleo dust boot.



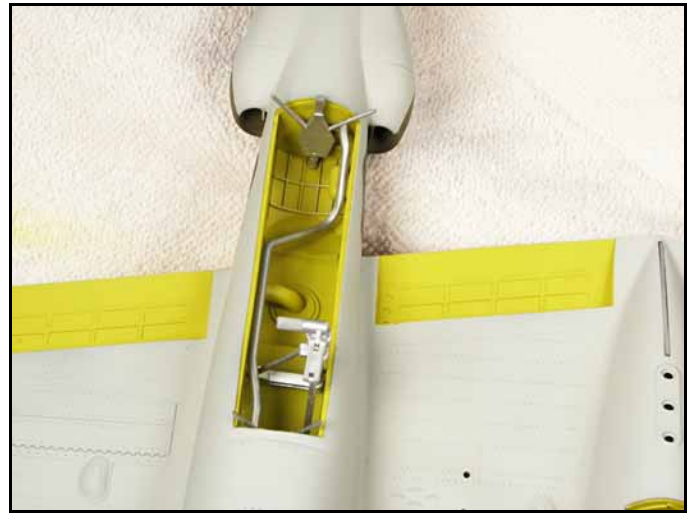
Sometimes landing gear parts should be assembled to check for fit problems. This is definitely the case for any kit where the landing gear has to be assembled at the same time as the landing gear bay.



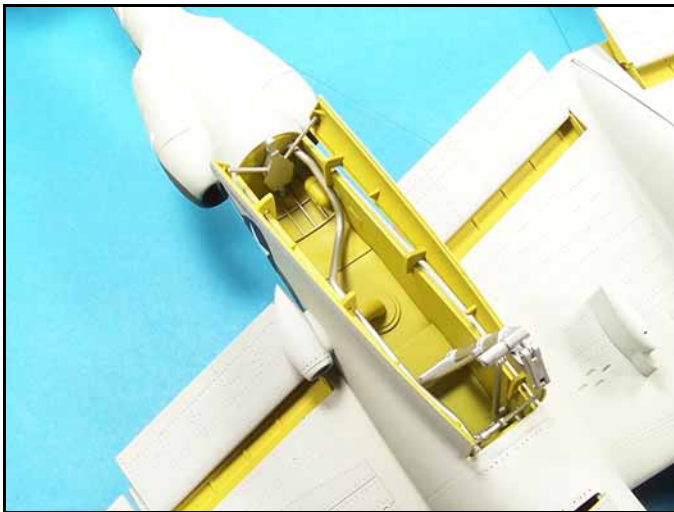
I pre-painted all the parts and then scraped off the paint from the glue attachment points so that I would have a strong assembly when completed.



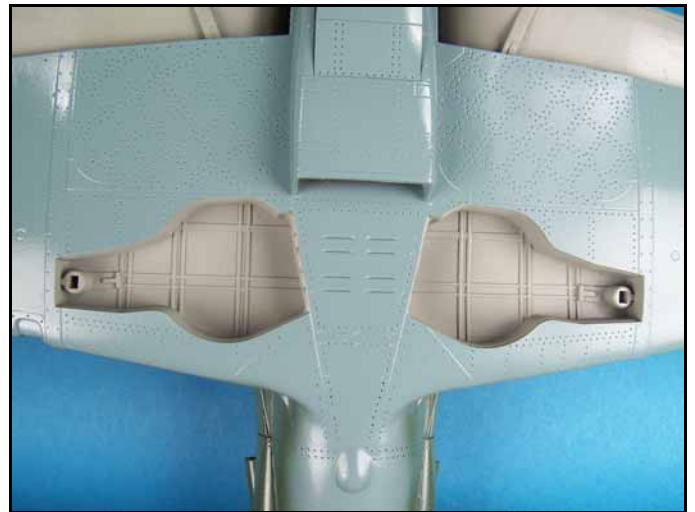
These P-38 boom landing gear bays are now ready for gluing into the booms. Note the plastic sheeting laminated to the outside areas to reinforce the sides.



The edges of the landing gear bays had super glue added to fill the tiny voids between them and the edges of the opening on the fuselage. I then carefully touched up the dried super glue with a detail brush.



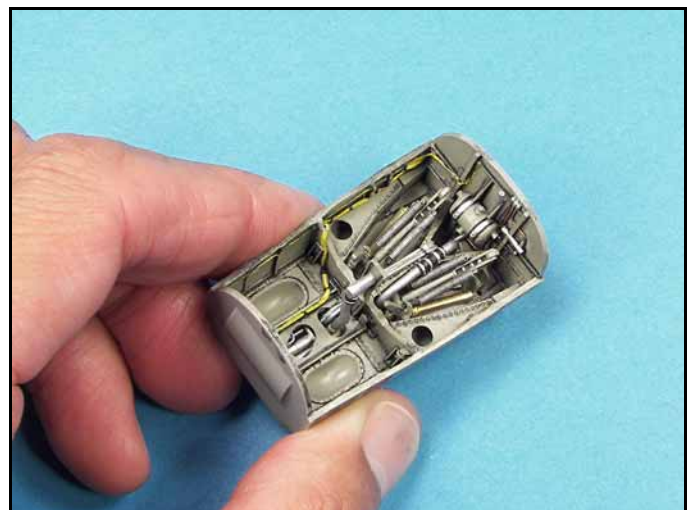
Now that the doors have been installed these landing gear bays look very busy.



The landing gear bays on this Mig-3 could use a little weathering to enhance their appearance.



Just a little black pastel dust sealed with Testors clear flat was all that was needed to make these landing gear bays look more realistic.



This one piece resin landing gear bay got the detail painting, black wash and drybrushing treatment. Note how the combination of these techniques makes all the added detail stand out. Model by Scott Weller.