

Landing Gear Part One

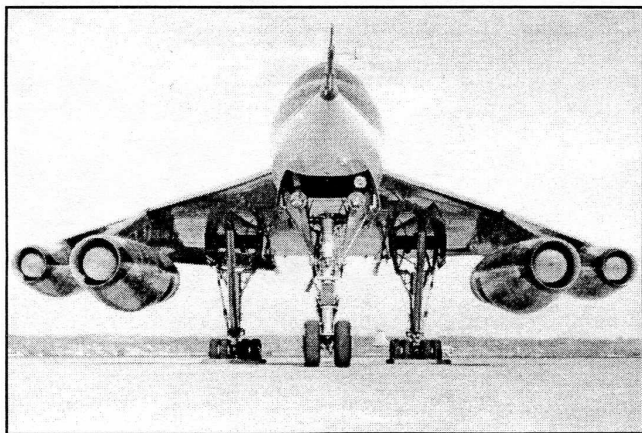
Getting Your Model Sitting Pretty

By Dave Irons

Landing Gear. Unless you solely build seaplanes or always mount your models on stands "in flight" you have to mount them on their landing gear. They are the bane of some modelers and the entire reason for building the kit to others. I personally love to build landing gear. Apparently as a small child I was fascinated by things with wheels & took great pleasure in removing said wheels & tires from toy cars and exchanging them with others 'til I got what I wanted. Couldn't leave well enough alone back then either!

The look and 'sit' of a particular aircraft on it's gear, and for that matter the configuration and even colour of the gear itself has always played an important part in whether or not I was interested in a particular aircraft let alone as a modeling subject. For example, I really like the look of a light coloured wheel on most aircraft and therefore did not even give the early F-15's a second glance, what with the wheels being painted black with only the tiny centre axle cap being white. I personally thought the aircraft's wheels looked stupid and clunky with all that black. Now that Eagle wheels are exclusively painted in a brilliant clean white, the aircraft as a whole looks very attractive to me sitting on it's gear.

Some aircraft suit darker coloured wheels and I think individually these subjects don't look right any other way. WW II Luftwaffe subjects for example. Me 262's, He-111's, Ju 88's and He 219's look great on their green, gray or black wheels. They seem to look even more sinister, especially the He 219, which is argueably the most sinister looking aircraft ever produced.



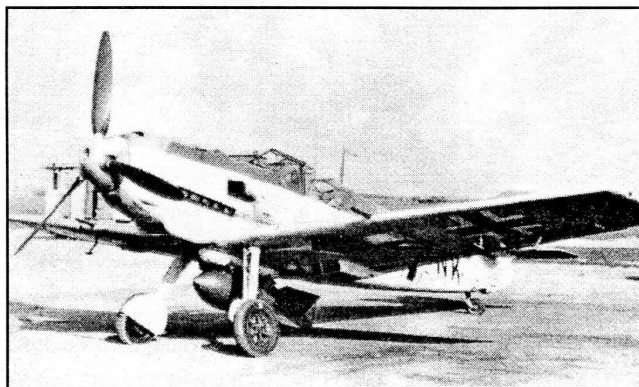
Convair B-58 scanned from Aerograph 4 by Jay Miller

I also tend toward aircraft with long gear struts for the most part, and prefer multiple wheels on each strut. B-1's Super Connies (oh what a wonderful nose gear), 707's example, but also like the look of a Herk on it's squat struts and great huge bulging tires.

The landing gear attached to any given aircraft adds to the specific personality of the aircraft, making it look graceful, tough, or as

mentioned earlier, sinister. It is therefore very crucial that when building a model of a particular subject, we get the landing gear right, or the 'look' of the model and consequently the aircraft's personality is not going to come out right. Skewed wheels, tilted struts, pigeon toes, etc... really detract from an otherwise excellent representation of a particular aircraft. Having such an affinity for landing gear, and long legged women for that matter, (hmmmm... wonder if there is some Fruedian connection here?) I really like to get the gear right. So here are some tips and easy techniques to help you get the 'sit and personality' of your model on it's legs just right.

Before you even attempt to assemble the landing gear of any model take the time to study all reference photos of the aircraft on it's gear. Make note of any angles the struts may have in relation to the aircraft. Do they angle out or in, are they angled forward, backward, or do they extend straight down from the wing? Are the

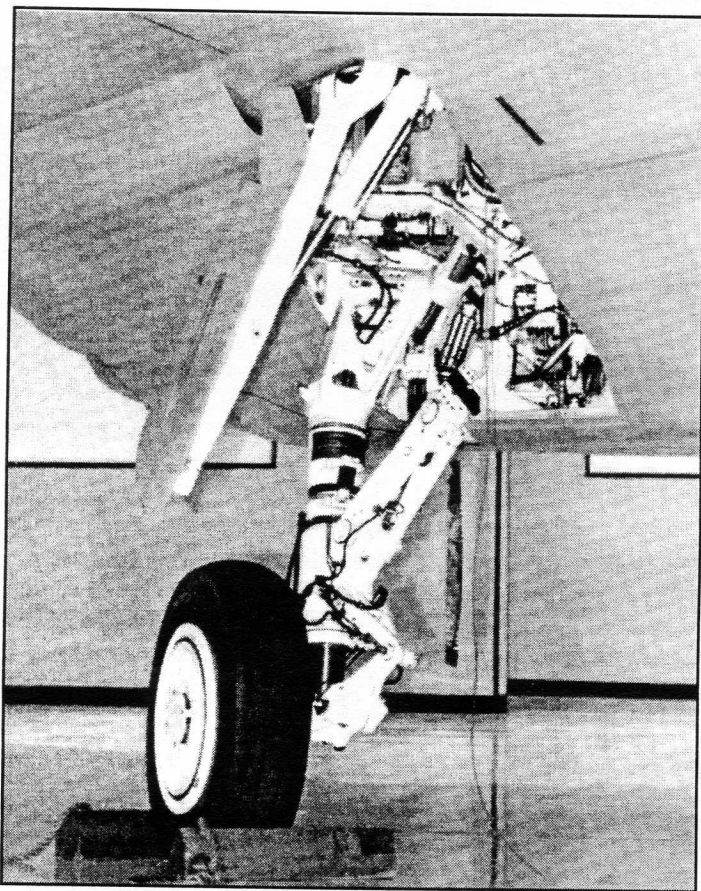


Bf 109E scanned from Classic Aircraft No. 2 by Roy Cross and Gerald Scarborough (collaboration with Hans J. Ebert)

wheels perpendicular to the ground or are they too mounted on an angle, either tilting in at the bottom or out? The Bf 109 is a classic example of a landing gear that requires careful research and assembly to get just right. The struts are 'splayed out', lean forward, and the wheels are not perpendicular to the ground, with the contact patch of the tire farther from the aircraft's centreline than at the wheels axle! Getting this gear aligned properly can be a nightmare and even the tiniest hint of being out of alignment can cost you dearly on the competition tables.

OK, now we have studied our references and have a good idea of what the finished gear should look like. Now we clean up any seam lines, ejection pin marks, etc. I personally find it easier to shave off the seam lines with a sharp blade and sharpen any creased with a fine file. Gap filling superglue is great for filling in those pesky ejector pin marks which are invariably always in the worst possible location! Adding little details like tie down rings, brake lines etc., can be done before painting, carefully picking out the details later. Brake lines can be fashioned from anything from

stretched sprue to fine wire depending on your preferences. On smaller scales I just attach the lines directly to the struts with glue but on 32nd and 24th scale have found another more realistic



*Lockheed F-22 scanned from Aerofax Extra 5
by Richard Abrams and Jay Miller*

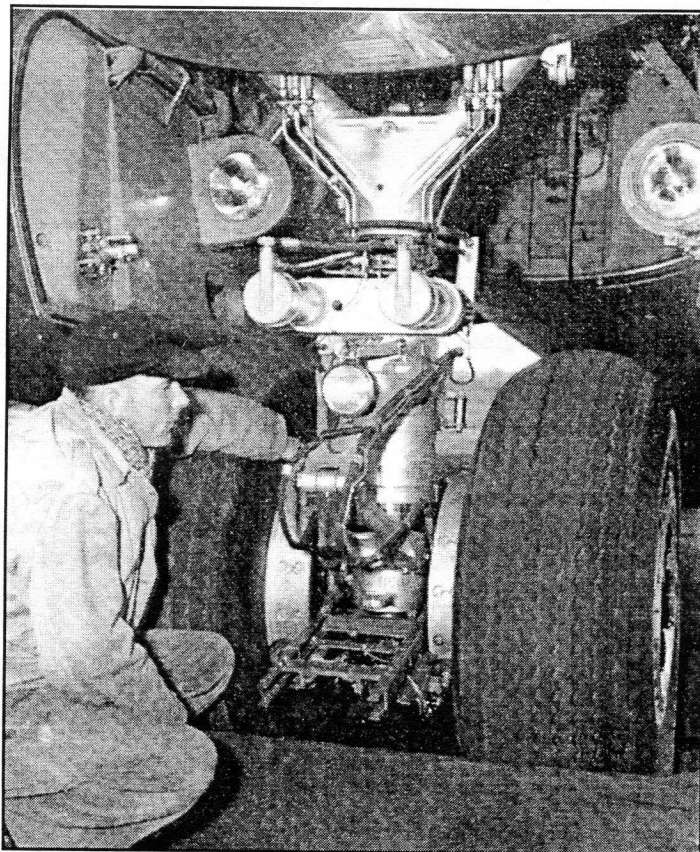
method. First I use stretched vinyl sprue, fine wire and thin solder to replicate the various types of hoses and hydraulic lines found on a given aircraft. Then I make up tiny little clamps from aluminum foil that act as keepers just like on the real aircraft.

Make the clamps as follows. Flatten a piece of aluminum foil on the table then carefully fold it in half giving a very sharp crease. Now unfold it about halfway and run a bead of superglue along the inside of the crease. Fold the foil back over trapping the superglue. You now have a fairly strong doubled over sheet of foil. Now, using a straightedge, carefully cut the doubled over foil into a thin strip using a new, sharp X-Acto blade. Cut this strip into short sections and wrap them over the 'hose' in the appropriate locations and superglue. Now you can glue the brackets to the gear struts and have a very realistic representation of the real McCoy. Some hydraulic lines are attached by wrapping a large hose clamp all the way around the strut, trapping the hydraulic lines under them. Use the same method as above, but wrap the foil band all the way around the strut as well. You can make the little 'wormscrew' attached to the band from a suitable diameter piece of styrene rod cut to size. Add any other details like valve stems etc., paint and weather the struts (later article) as applicable and set everything aside to dry.

You will most likely have to clean up a mold or joint seam on the

tires as well. This is usually found right down the middle and depending on the tread pattern can be a simple job or a difficult one. I generally rescribe the tread before I remove it, going a little deeper than the kits lines. Now, when I sand the seam smooth I have a bit of a guide to use when cleaning up the tread itself. Since all tires eventually wear, it is really not important to get the tread back to pristine condition unless you are modeling a brand new aircraft. In fact, a lot of aircraft I have seen had downright worn tires with some having no tread left at all near the centreline, F-18's included!!

Now dry fit the finished landing gear strut to the model and eyeball it to see if it's alignment even comes close to the photos. Interestingly, some of the most intricate looking landing gear is the easiest to align. Once assembled properly, gear with multiple attachment points, like Beaufighters, Tigercats (thought that one would be a nightmare), and Catalinas etc. have a sturdy base, and if the manufacturer has the mounting holes in the right places, just



*Martin XB-51 scanned from Air Force Legends Number 201
by Scott Libis*

fall into place. If things don't look right, start wiggling and adjusting the struts until you are happy with the angles. Use great care in doing this as the weight of the model will be resting on whatever modifications you will make here. Once you are satisfied with the look of the gear and assuming that you are now ready to install them, attach one strut (I'm talking about the mains here) and get it perfectly aligned before the glue sets. Once this strut is dry, attach the other, being careful to align it to the photos once again, but more importantly align it to be a mirror image of the first one. Nothing stands out more than misaligned struts on the same aircraft.

To make this whole process a little easier I sometimes utilize an easy to make jig. First I draw a straight line on a piece of paper to represent the aircraft's centreline. Then I draw a perpendicular line across it that will be my wing 'leading edge' datum line. I will use this second line to arrange blocks that I will butt the leading edge up to. Now I determine the position of the lower end of the strut. It's distance out from the centreline and it's distance forward or aft of the leading edge line, and mark these locations on the paper. Now, with the model up on blocks that allow the gear to just clear the paper, I can carefully adjust the struts until the bottom ends are exactly where I want them.

Once the gear is completely dry it's time to attach the wheels. Again, study the photos and attach the wheels with the correct angles, both from the front and 'toe in', when viewed from the top. Blocking the model up just above a mirror will really accentuate any differences between the wheels and aid in getting them equal. On aircraft with multiple bogie assemblies like a B-1 for instance it is crucial to get all the wheels straight and aligned with each other as their close proximity will really accentuate any misalignment!

OK, assuming everything has gone well up to this point and the model is sitting on the most beautiful, sturdy, best aligned set of landing gear ever assembled by you or anyone else for that matter (Whew!), there is one more little thing that we have to do.

Nothing, and I mean nothing disappoints me more than seeing an otherwise excellent model sitting on tires that must have at least 10,000 lbs. of air pressure in them!!!!!! Here we have fully loaded B-52 perched on eight perfectly round tires with not even the tiniest hint of a flat spot!! Drives me nuts (and it's not a far drive!). Go out in the driveway, look at the car, note that the bottom of the tire (the part touching the ground) has slightly conformed to the shape of the ground? Airplanes are no different, the tires are some sort of flexible rubber compound and filled with air, the same principles apply! For god's sake, get some king of flat spot on the tires people!!!!!!

There are plenty of aftermarket "bulged and flattened" wheel assemblies out there. Most suffer from the same problem. They are TOO flat. I wouldn't sign off an aircraft from the crew chief with tires as flat as most of those. They would probably heat up and blow before you got to the runway! Granted, there are exceptions. An Mi-24 Hind helicopter for example has low pressure tires that are very bulged and flat, and those on a Hercules

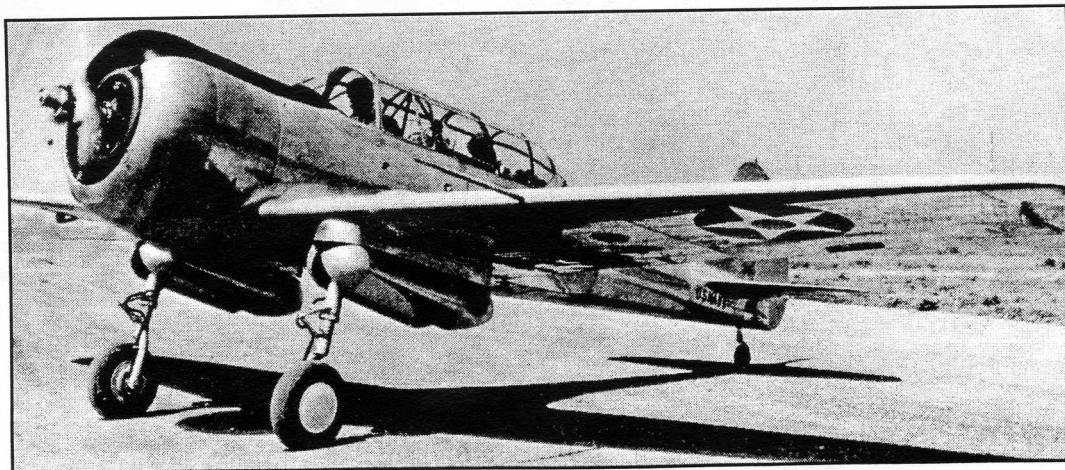
have a pretty large contact patch as well, but for the most part the flat part is very subtle, especially on today's jets that operate from hardened runways.

There are many methods of doing this for yourself. One is to carefully heat a portion of the wheel, then press it down on the counter to give the tire a bit of bulge and flatness. Risky, if you misjudge you have ruined the wheel. If you want to use this method you better practice on some old model wheels first. It's also very difficult to get a lot of wheels the same using this method and can have a disastrous looking effect on a B-52 or B-1 for instance. I used a variation of this method on my Tamiya Phantom, which had 'rubber' tires. I threaded both main gear tires over a piece of doweling of suitable diameter, then carefully heated one part of both tires with a blow dryer until they began to soften, then pressed them down on a glass table top and held them level until they cooled. When I removed them and mounted them on the wheels the effect was perfect. I had a slight bulge and a very realistic looking flat spot. In 1/32 scale, with rubber tires this approach worked great.

With the smaller scales, even 1/48, I generally find the following technique works well and have yet to hear any complaints from judges about it. After the tires are mounted on the struts, set the model on the table and have a good look at the way it sits. Now, very carefully lift one wing slightly and slide a sheet of sandpaper under one wheel, rough side up. Drop the model back down with the wheel on the paper. Now very carefully start sliding the sandpaper around under the model's wheel while holding the model still. Don't apply too much pressure and watch to see that the strut is not flexing too much, you don't want to break it off! You may have to carefully hold the wheel itself while doing this. Just take off a little material this way, then do the other side. Once you are satisfied with the flat spot and both (or all) wheels are even, touch up the bottom of the tires with paint and you are done. Don't worry about rescribing the tread back onto the flat spot, only an idiot of a judge would fault you for this.

If the aircraft you have modeled had a solid rubber tail wheel as did many WW II US navy aircraft, don't sand anything away, or just give it one light pass with the sandpaper.

Well, there you go, finally an article that really talks about landing gear. Next time, Part Two: Brake dust, oil and mud, weathering your aircraft's landing gear and wheels. Happy Modeling!



Curtiss SNC-1 scanned from Wings, October 1991. Article by Peter M. Bowers