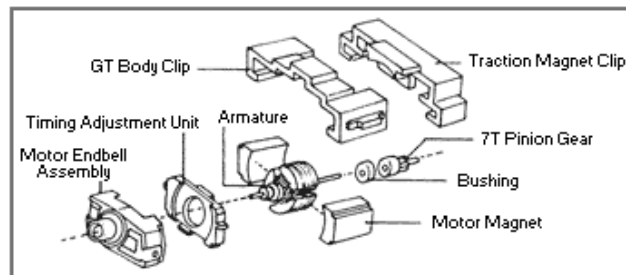
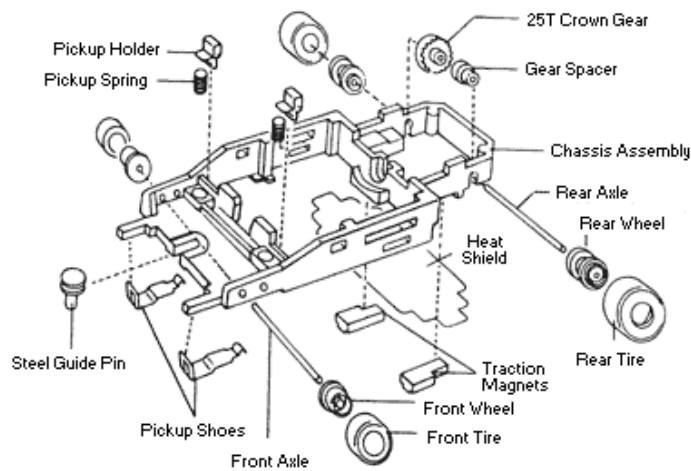




The Magazine For Slot Car Enthusiasts

# Building the Tomy Super G+



## Building the Tomy Super G+

By [Milt Surratt](#)

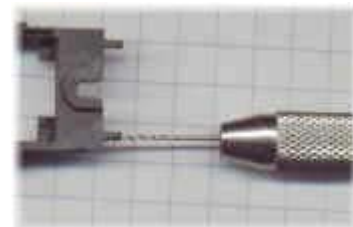
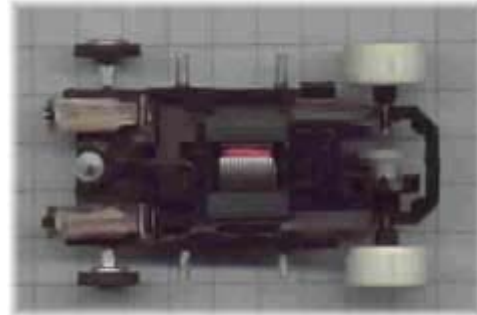
Tomy Super G+ slot cars have been around in the current form for about 12 years. Out of the package, the Tomy HO slot car is already fast, but we want to talk about making it REALLY fast, right?

To begin with, a Tomy Super G+ has much more magnetic downforce than a Tyco or Lifelike slot car. This is mostly due to the type of magnet used. Tyco's and Lifelike's use a ceramic type of magnet, where the Tomy car has light Polymer traction magnets, which are greater in strength.. Not only are they a stronger magnet, they are also longer than the typical Tyco tractions, plus they sit lower in the chassis and are more centered over the track rails. (A Lifelike HO car has no traction magnets, the motor magnets perform both functions).

All of this combines to give you more "mechanical" downforce than other store bought super stock HO slot cars, plus you get a lower center of gravity, for better handling.

### Building a Super Stock Tomy G+

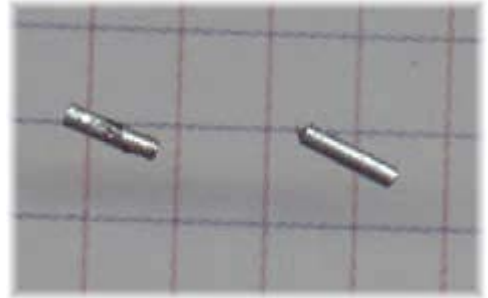
The first thing you need to do is acquire a chassis or two. These are not as "scientific" as a Tyco chassis (see Tyco Super Stock tips). You can generally buy a car off the shelf and follow the steps outlined below to build your car, or you can buy a "ready built" chassis, with body mounting tubes and axle pins, etc. There are different numbers on a Tomy chassis (1 and 2) found up front to the left of the guide pin. The front bulkhead has the numbers 1 or 2 printed on the inside as well. I have found that the only significance between the use of either chassis is that you can run smaller rear tires on a #1 chassis, sometimes two or three sizes smaller. (430 / 434 as opposed to 434 / 436). There seems to be no reason for, or against, using a No. 1 bulkhead with a No. 2 chassis, or vise/versa. If anyone has ideas about this, I welcome them.



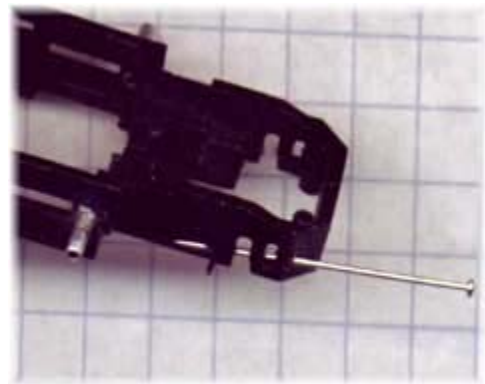
Now that you have a chassis, it needs to be "race prepped". The race car needs body mounting tubes, front shoe hangers pinned, and the rear of the chassis needs to be drilled for axle pins. (More on that later). You can do all this yourself, if you feel up to the challenge, but some may find it better to have at least the body tubes done for them with a jig, for simplicity of interchangeable bodies with other racers and your other cars.



You will need a pin vice and bits. These are found at just about any hardware or hobby store for less than \$10. Also, get some .020 piano wire (.25 cents). Using a #23 bit, carefully align the drill to the end of one shoe hanger. Find the very center, and begin to drill slowly into the tip of the hanger. It's very important that you turn the chassis different angles, so that you maintain a straight attack into the hanger! Do not go too fast, as consistency and alignment is what you are looking for. Continue to drill into the hanger till you are actually drilling into the chassis, about 1/4 inch.



After smoothing one end of the piano wire, dab a little Black Max adhesive on the end of the wire and stick this end into the drilled hole until it bottoms out into the chassis. At this point, break the remaining wire off with dikes, and use a Dremel or similar device to bring the edge smooth and flush with the end of the hanger. Do the other side the same way and you now have a "bulletproof" front end.



Next, you will want to attach the pin tubes for mounting your Lexan body. Again, if you plan on racing multiple cars, and you don't want to have a separate body for each car, you might want to find someone that has a chassis "jig" for drilling these holes in the same spot on each chassis. Otherwise, proceed on, maestro.



Pick your spots. The tubes on the chassis to the right are mounted in the strongest areas and about as far apart as you can put them on a Tomy. Another method is to mount both

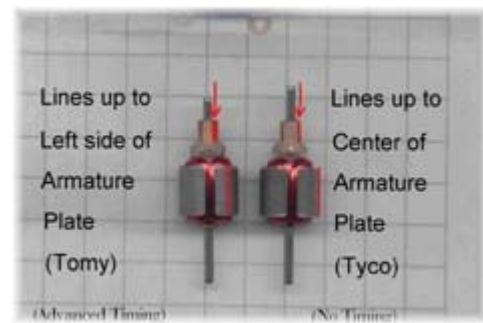
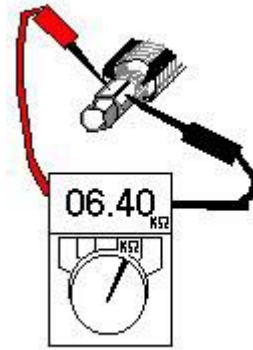
tubes as low as possible, but I find that the rear portion of a Tomy chassis is too weak to support the lower mounted tube. Using a #62 bit, drill carefully and slowly into the points you have picked for the tubes. Pay close attention to the mounting holes, so they will not be in conflict with the front end-bell support or rear magnet support on the inside of the chassis!

Buy, beg, borrow (but don't steal) a set of **THREADED** aluminum or brass body tubes. Don't use the flanged kind, as they just will not stay in the hole, no matter what kind of gorilla snot glue you try. Squirt just a little bit of Black Max adhesive onto the threads. Thread the tube in by using your pin vise (not too tight around the aluminum, as it will smash) until they seat nicely and flush with the inside of the chassis.

Next, we need to keep the rear axle in place. A stock Tomy axle will pop out on a hard impact, but for racing purposes, it is even better to use a Tyco axle on a Tomy car. They are slightly smaller in diameter (.059 instead of .062) which helps "free-up" the rear of a Tomy Super G. This, of course, makes the axle even more prone to popping out of the chassis, so we pin them for protection.

When you are done with this step, you should be able to install your rear axle, and the pins should go in and support the axle,

Align the bottom edge of the rear axle hole with the end of the chassis where it is angled and mark that area with a line. Find the area that is exactly even with the center of the chassis wall (huh?) and the line you made for the bottom of the axle hole and make another line, intersecting the first. Using a #25 drill bit, begin to drill slowly at an angle at first where the lines intersect (huh?). Stop, and trim this area out with a sharp hobby knife. Now line the drill bit up straight with the wall of the chassis and drill directly forward and at a slight angle, going slowly and checking your progress regularly. The hole you drill should be about a 1/2" long and will end up between



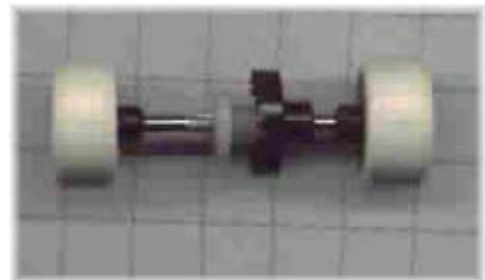
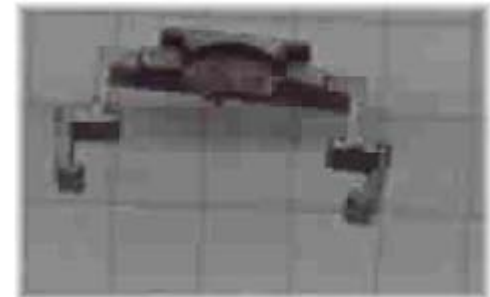
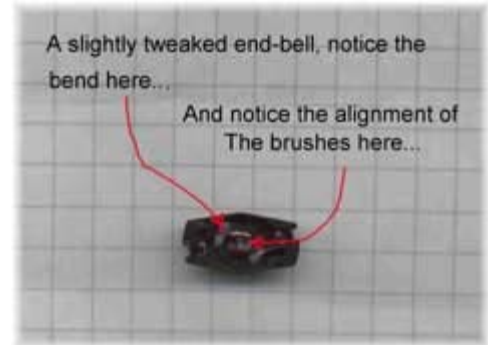
the top of the traction magnet and the support piece above it. Next, you will trim one of the straight pins to a 1/2" inch length, and sharpen the end, then insert it into the drilled hole.

### Now for the go fast stuff!

You must have POWER (har, har). Many guys out there sell "hand picked" armatures. Some of these are really good, and some are not. So what I do is to buy a bunch of cheap arms and go through them until I find one that is balanced (naturally, of course - anything else would be cheating).

How do you find a balanced arm? One way is to take a couple of double edge razor blades and mount them into a firm piece of flat plastic or wood. Make sure that both edges are parallel and the same distance apart. Set your new arm on the two edges and see if it rolls freely, or begins to want to come to rest, always at the same spot. If this happens, you might as well throw it away, as balancing an armature in any way is usually illegal. Continue until you find an armature that has the best roll to it. This will be your race motor. If you want to be real scientific about it, you can also OHM the armature (see Slot Car Enthusiast vol. 1). This can give you a reading, based on resistance, of how well the armature will perform, if balanced. As close to 5.8 ohms as you can get is best, but most Tomy arms tend to be in the 6.1 to 6.4 range. This is relative, as a lower number means less resistance i.e. better rpm, but could also mean that the arm will never reach it's optimum rpm and will therefore feel sluggish. Putting a very tall gear on the car (7/23 or even 7/24) helps but this can be an actual disadvantage if your car tends to be set up to run low, because the taller gears can physically touch the track (not a good thing!).

Now that you have found the "perfect" armature, you really need "perfect" magnets. The ones that came with that Super G+ you bought back in 1988 probably won't be very effective, as magnets lose strength from many factors, including heat, use, dropping, etc. It is best if you buy a matched set from someone. This just means that some smart lug-nut gear head with a degree and a gauss meter has checked the power of the magnets (motors and tractions) to find a set with the highest gauss reading. This can also be attained by having the



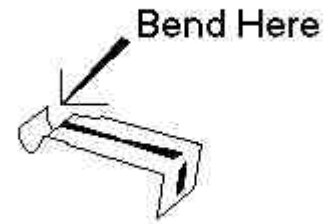
magnets zapped by that self same lug-nut. Zapping of magnets (if it is even allowed in your racing circle) is a good way to bring power back to used magnets, but they can never be zapped to a power greater than their original state, and usually won't ever get completely back to their highest rating.

You will need the following items to complete the building of the motor portion of your super stocker:

A front end-bell. This can be stock (copper) or if your rules allow, silver or gold.

The front bulk head.

The stock rear bushing that came with the car.



The nylon washer that came on the armature (or a phenolic washer).

The stock pinion.

The shoe hanger contacts. These can be the stock copper ones or if your rules allow, silver or gold.

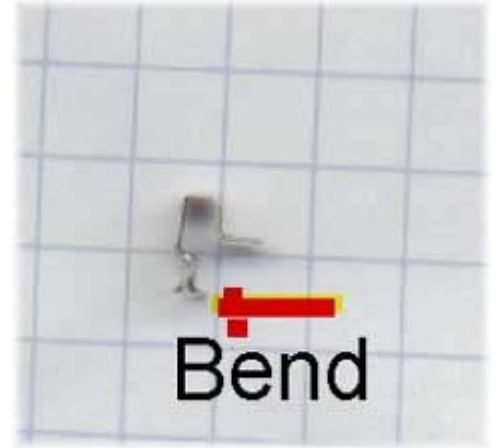
Extended flat pick-up shoes.

Pick-up shoe springs. These can be stock, silver, or gold (check the rules).

One very unique thing about a Tomy (or a Lifelike) armature is that it has advanced timing. Tyco arms have 0 degrees of timing. The pictures at right show the difference. The three poles of the Tyco arm line up evenly with the armature plates, giving you low torque, where on the Tomy, they are forward (right) of dead center, giving you increased rpm. Keep this in mind as we set up your end-bell, as it is adjustable for even more advance on long tracks, or you can decrease the timing for shorter tracks.

Setting up the end-bell for max performance is extremely important. It can be done two different ways. One is with a BSRT end-bell removal tool, the other is more conventional, using pliers. If you have an end-bell removal tool, insert it into the end-bell and turn it as if you were going to install it onto an armature. Now, take a small bladed screwdriver and push the end of each spring down towards the center of the end-bell, until they are apart from each other the same distance as the commutator on the armature. Make sure that the brushes stay parallel with each other when you pull the tool out. It never hurts if the brushes aren't completely side by side, just as long as they are parallel.

If you don't have an end-bell tool, take the stock end-bell, and using a pair of needle nose pliers, grasp the portion of the spring where it attaches to the end-bell. Bend this slightly up, towards the center of the end-bell. Now grasp the part just behind the brush and bend it at a slight angle. After you have done both springs, push one spring and brush assembly away from the other. The un-touched spring and brush should follow the one that is being pushed. It should follow all the way to about the center of the bronze bushing mounted at the front of the end-bell, if not, bend a little more. It is very important that you maintain the same amount of tension on both springs, so keep checking to make sure both follow each other the same amount. You also need to check that the brushes continue to be completely parallel to each other.



Now you should be able to install the end-bell and front bulk head onto the armature. Once this is done, install your motor magnets with the white painted one facing up and on the right side of the chassis. The bushing on the back of the armature will line up with the rounded out portion of the chassis, then use a small bladed screwdriver to push the front ski contacts out of the way. Simply align the arm and magnet assembly up and push down slightly on one side. With a thumbnail or that screwdriver, pry the other side of the chassis out a little and push the assembly down. It should snap into place, with the bushing aligned properly. Install the traction magnets and snap the rear magnet holder in place over the top of the chassis. Push the motor magnets out a little to make sure they are located properly (sometimes you hear a slight snap when you push the magnets into place).

Now you have just to insert the pick-up springs into their holes, install the shoes into the holders and snap them over your pinned hangers and you should be able to try it to see if it at least runs!

Try not to give a bunch a throttle all at once until you have broken the commutator in. And you really should oil it first!

Next you need a pinion, a stock one will do. A hardened steel axle is very advisable on a Tomy because of the speeds possible, but you can get away with a stock one for now (remember to use a Tyco sized axle). Mount some good silicone coated tires (your choice of brand) and a 20, 21 or 22 tooth spur gear (depending on the car, the track and your driving style) and snap the axle in place. You may want one thin spacer between the gear and the chassis, depending on the brand of gear you prefer to run. Don't forget those handy pins you made!

For the front, if your club allows, you should get yourself a good set of independent front wheels and narrow, slip on front tires. These have better rolling resistance than stock tires and allow you to change tire height at will.

Your next step is to run the car around a track, checking for how the shoes are contacting the rail surface and how much spring pressure you have to adjust out, and how well the car runs and handles, which will indicate whether you need to go up in tire size (you can hear the car scraping or clicking on the

track and it seems to “skate” out of the slot) or down (the car just sails out of the slot).

The rest is up to you, but you should now have a car that is more than capable on the track, depending mostly on set-up and driving style.

You should also bend the shoe hanger to maintain the shoe on the car. This also helps to keep the bottom of the shoe hanger from hitting the track rail.

Next, you will need to paint and mount a Lexan body to your car.

