The Art Of Installing A Seat

So you have that new chassis and you now need to mount the seat. Mounting a seat can be a painful experience, and if not done correctly, can lead to problems on the track. I have mounted a number of seats over the 10 years I have been in karting and I have developed a simple step by step process that includes some hints to help prevent issues down the road.

First of all, you have to make sure that you have a seat that fits you properly. The best way to choose a seat is to actually sit in one before you buy it. Fiberglass seats are made in high production volumes and the tolerance in sizes can be larger than you think. Go to your local kart shop find a seat you like, put it on a carpeted floor and try it on. The seat should be snug but not tight. Your upper torso should also fit deep enough into the seat that your sides are supported and not on a pressure point that could cause rib soreness or even injury. As you sit in the seat on the kart shop floor, you need to keep in mind that the seat will flex less after it is mounted to your chassis so if it is a little tight now it will be too tight after mounted up.

After you have made your seat selection you will need some seat mounting hardware. Many of the bigger name seat manufacturers sell seat mounting hardware in a kit with everything you need. If you choose not to go that route you will need some basic hardware.

Hardware:

- **4 – Flat head Allen cap bolt (usually 8 X 25 mm) for the upper seat mounts and seat struts**
- **2 – Flat head Allen cap bolt (usually 8 X 80 mm) for the lower seat mounts**
- **6 – Conical washers to fit the bolts you're are using (I recommend plastic)**
- **6 – Large fender washers**
- **6 – Large rubber washers at least as big as the fender washers**
- **6 – Regular washers to fit the bolts**
- **6 – Nylon lock nuts**

I recommend the plastic conical washers because the surface of the fiberglass seat is not at all flat. Using an aluminum conical washer will eventually dig into the fiberglass and with the vibration from the engine, will crack or wear through the seat itself. I also use the rubber washers and fender washers for the same reason. Use the rubber washer between the fender washer and the seat to keep the fender washer from digging in. Use the fender washer to provide enough mounting surface for the seat struts and seat mounts to disperse the load over a large enough area of the seat.

As for what tools you will need, I recommend using some sort of seat mounting jig that holds the seat at the correct height from the frame rails. I use a nice seat jig specially made for this, but you could use a piece of wood taped securely to the bottom of the frame rails. Since most seat bottoms are flat these days, you can take advantage of it. That flat surface makes it easy to set the seat in place. I also use another small jig to hold the seat back relative to the rear axle. Again, if you don't have the jig, you can make something out of wood. These jigs, while not required, will make the seat mounting job much easier to do. Other tools you will need:

Tools:

- **Large rubber mallet**
- **Electric Drill with proper drill bits**
- **Measuring tape** (I prefer metric, fractions are too hard on my brain)
- **Permanent marker**
- **Wrenches**

Ok now you have your seat, your tools and hardware. You are ready to go right? Wrong. You need to get with your chassis manufacturer and have them tell you the recommended seat mounting locations for your chassis. This may sound unnecessary, but when your chassis was developed one of the things that was tested and dialed in was the seat location. Having the seat in the proper location will not only help the chassis behave like it was designed to, but will also ergonomically fit you better. All of the major chassis manufacturers have this information available. Just give them a call. If your manufacturer doesn't have it or if you have an old chassis that is

Seat Attachments – *The welded, or sometimes clamped-on tube that connects the seat to the frame just in front of the axle.*

Tabs – *flattened part of the tube with the hole in it on seat attachments or seat struts.*

Top:Using a seat jig to help locate the height of the seat will make the seat mounting task easier.

Above: Mark the location for the upper seat attachments after the seat in the recommended position.

Below: You can tape a piece of wood to the bottom of the seat to adjust the height of the seat

Have someone measure that location relative to the rear axle and the steering upright. This will be a decent starting point.

Now that you know where to mount your seat, you will need to start to fit the seat in place. This is a somewhat tedious process but if you take your time and do it right the rest of the process will go much easier. Attach the seat jig or piece of wood to the bottom of the frame rails. This will define the height of the seat relative to the frame rails. To adjust, I simply tape a small block of wood to the flat portion of the bottom of the seat. This will also help to define the seat back angle as well.

You will need to bend the welded upper seat attachments in or out to accommodate your sized seat. As a rule of thumb only bend the left side one. The one on the right is set to make room for the engine. Moving that one outboard will cause clearance issues when you put the engine on. To bend the seat attachment simply hit it with a large rubber mallet or dead blow hammer. Be mindful not to bend these large amounts or bend then in and out multiple times as that can cause cracks in the steel.

Use a rubber mallet or dead-blow hammer to bend the seat attachments in or out as needed.

Continue to adjust the attachments until the seat sets on the seat jig and snuggly between the seat attachments.

With the seat sitting on the lower frame jig and the attachments snuggly holding the sides of the seat, you can begin to set the exact location of the seat in the kart. Most manufactures will give you measurements from the front kingpin to the rear centerline of the seat as well as the distance from the rear axle to the lip of the seat back. Moving your seat around, resetting the attachments as needed measure and re-measure until your seat is right where it is supposed to be. Carefully look at the overall location of the seat and make sure it makes sense. Is the bottom of the seat too high or too low? Does it look offset too much relative to the steering wheel? Is it rotated in place relative to the steering wheel? Again take your time and do it right.

With the seat now set and in the recommended location, mark where the holes need to be for the no longer supported, follow these simply rules of thumb:

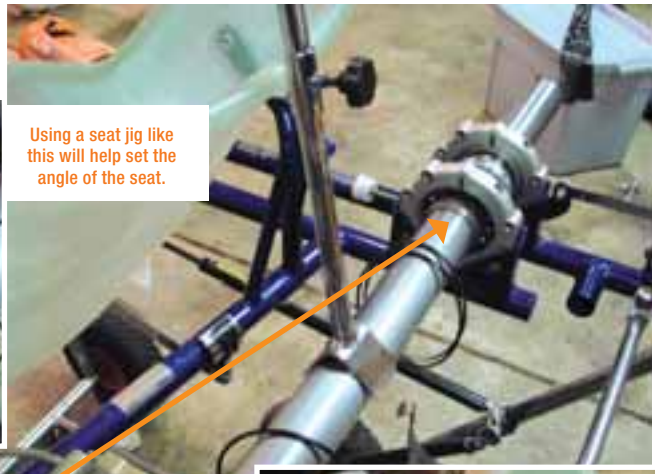
1. Set the bottom of the seat even or just slightly higher than the bottom of the frame rails. This will keep the seat from bottoming out on the track when you go off.

2. The center of the seat will most likely need to be slightly offset to the left relative to the steering wheel. This is to make room for the engine on the right side and help balance out the corner weights on the scales.

3. Set the chassis on the ground and put the seat approximately where it will mount and sit in it. Grab the steering wheel and tilt the seat fore and aft until you find something that feels comfortable.

upper seat locations. Do not drill yet! Now you need to do some fine tuning to make sure the seat sits in place without binding or having unnecessary pressure points that can eventually crack the fiberglass. To do this notice the mounting tab orientation relative to the seat itself. You need to make sure the tab sits as flush as possible to the seat. Adjusting this is a matter of using an adjustable wrench and twisting or bending the tab to make it mate flush with the seat. This again will take some trial and error but if done correctly you won't be driving with a cracked or broken seat halfway through the season. Now with the tabs properly adjusted it is time to drill the holes for the upper attachments. Make sure the marks are still correct after you adjusted the tabs. If they are, simply drill the holes in the locations you have already marked. If not, remark and re-measure to be sure. Remember measure twice, drill once.

Use an adjustable wrench to twist and bend the tabs to mate up with the seat.



Using a seat jig like this will help set the angle of the seat.

Cassettes – *The aluminum machined piece that holds the rear axle bearings to the frame.*

One of the common location measures is the distance from the rear axle to the lip of the seat.

OK, with those two holes drilled you can put in some bolts. Using the shorter of your mounting bolts slide the bolt through the plastic conical washer and then through the seat. Put the rubber washer and fender washer between the seat attachment and the seat. Make sure to put the rubber washer between the seat and the washer. This will keep the fender washer from digging into the fiberglass. Repeat this for the opposite side. Use a small washer between the nylon locknut and the seat attachment and tighten until just barely snug. You will still need to move the seat around slightly for future steps.

Now for the easy part, with the seat supported by the two side bolts, and still being held up by the lower seat jig it is time to work on the lower seat attachment points. These are small tabs welded to the frame right behind the steering upright. Like before you will need to use the adjustable wrench to bend or rotate the tab to be parallel to the seat surface. This will provide a more stable and secure platform to support the seat. You will likely need to come up with some kind of spacer between the tab and the seat to make up the difference in height. The most common practice here is to use a bunch of large washers or aluminum spacers. I use simple grey 1/2in PVC plumbing pipe cut to length. It's lightweight, inexpensive and easy to work with.

If you are using a clear fiberglass seat, marking the holes for the lower attachments is simple. I put a pencil through the attachment point until it touches the bottom of the seat. Make sure the angle of the pencil is perpendicular to

Using a rubber washer between the seat will keep the fiberglass from developing cracks later in the season.

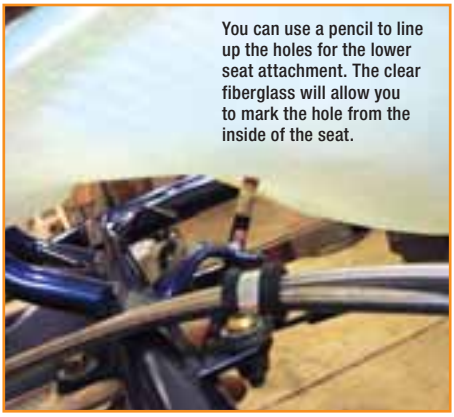
Always use nylon lock washers to mount your seat.

the tab and seat. Now since the seat is somewhat transparent you will be able to see the erasure end of the pencil though the seat to mark the hole. Now simply drill the hole from the seat side. If you are using a black or opaque seat you will need to mark the holes from the bottom side and take the seat out to drill the holes.

Use the same hardware attachment technique as with the upper attachment. Make sure to put the rubber washer between the seat and the fender washer. Then put the spacer in place. Tighten all of the seat bolts down and you are basically done. Don't over tighten the bolts to the point you hear cracking. Fiberglass, no matter how strong, can't match the strength of the steel bolts. If you hear too much creaking, you might need to look at the orientation of the tabs relative to the seat again. They need to be parallel and mate at closely as possible to the seat.

Now with the seat bolted in place, it is time to consider seat struts. Seat struts are a tuning tool than are standard equipment on 99% of all karts. They are simple semi round tubes that attach to the seat and the axle bearing cassettes. These provide additional stiffness to the upper seat structure and add stiffness to the rear of the kart. Again contact your chassis manufacturer about how many seat struts to use and where to attach them. Use the same techniques as the seat attachments to put the seat struts on as well. If your axle cassettes are threaded. be sure to use a thread locking compound to keep that bolt from loosening out on the track.

Measure and adjust, and repeat until the seat is right where it is supposed to be.



You can use a pencil to line up the holes for the lower seat attachment. The clear fiberglass will allow you to mark the hole from the inside of the seat.

So that is the simple step by step process to mount a seat. Remember to use rubber washers between the seat and the washers, bend the tabs so they mate with the surface of the seat and always measure twice and drill once. Using these techniques and taking the time to do it right will help make sure you have a successful karting season.

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Seat Struts –

The bolted-on tube that attaches the seat to the rear axle cassettes

Use the same techniques with the seat struts as you would the seat attachments.