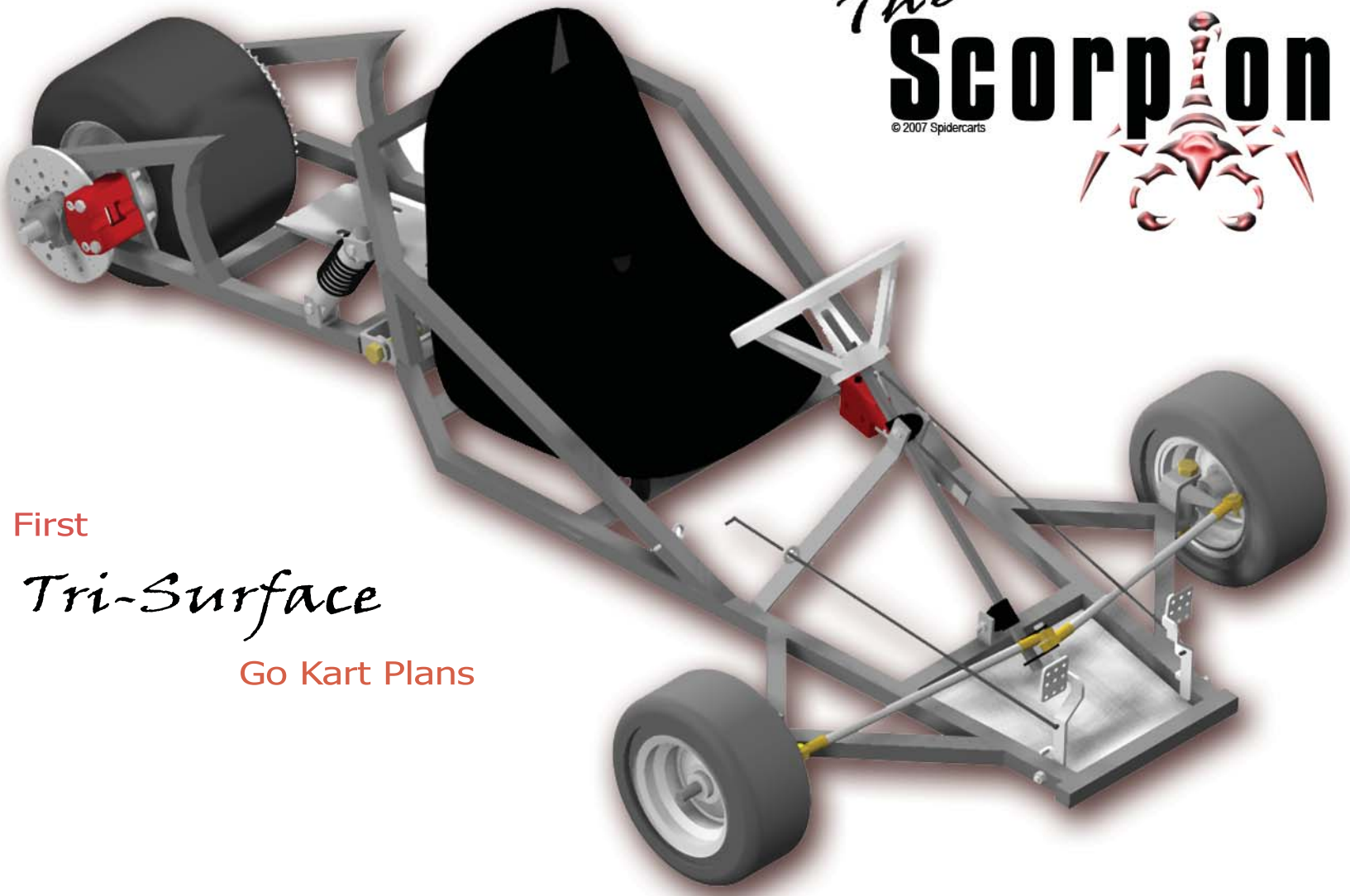
The Scorpion



The First

Tri-Surface

Go Kart Plans

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		SCORPION GO KART				

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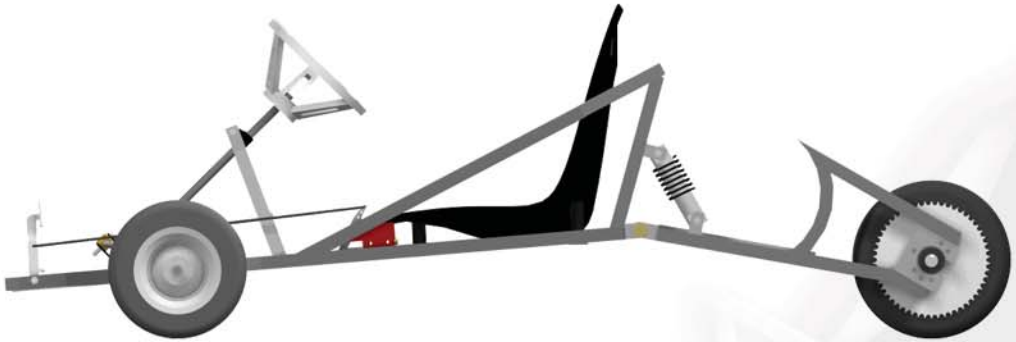

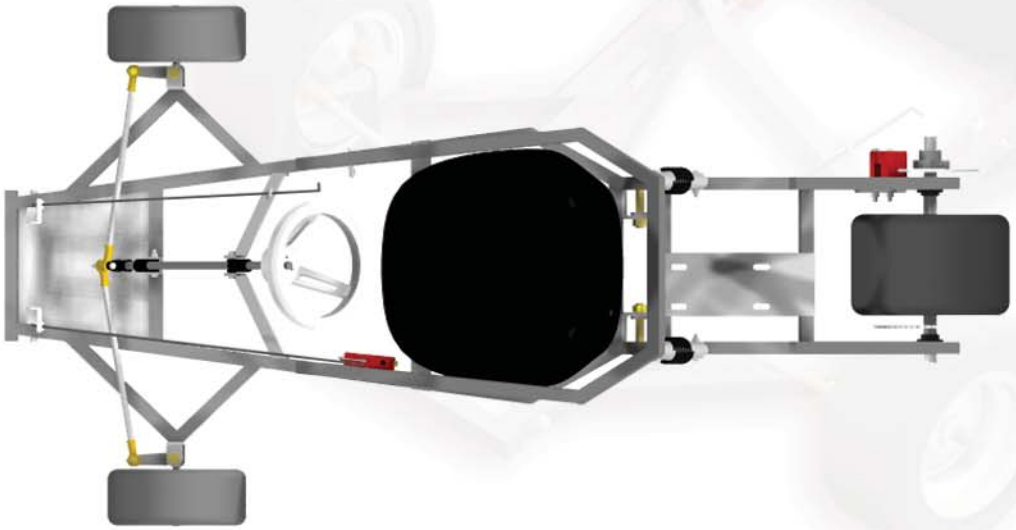

Length	6′
Width	2′ 6″
Wheel Base	3′ 6″
Wheel Rear	7.25 x 6.0
Wheels Front	5.0 x 6.0
Tires Rear	12.0x800-6
Tires Front	10.5X450-6
Clearance	3″ to Frame
Chassis	1″ #14 Square
Weight	62 Pounds
Motor	6.0 hp Horz Shaft
Transmission	Centrifugal Clutch
Brakes	Hydraulic Disc
Steering	Tie Rods/ Pitman

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		SPECIFICATIONS				

Thank you and welcome to your new Scorpion eBook.

As you can see these plans are easy, fun and full of great information to walk you through completing your Scorpion Go Kart.

Our special feature in these eBooks is the "Exploded View". Exploded view is a brand new concept we have implemented and we think you will love it. Use this like a webpage with links. You just click on the part you need to build or get info on and it will take you right to it. So use the bookmarks and the exploded view to quickly navigate the eBook. Give it a whirl!

Tools section will just give you brief overview of tools you could use to build the Recluse. Of course use what you have or find fits your needs.

Materials section will give you a shopping list for the raw metal you will need to finish your kart.

Step by Step will walk you through the correct order of the build.

Diagrams detail every part and section of the kart.

Parts List is a list of all the hardware needed to finish off the kart after you are done welding. We have linked all the parts to a vendor we use for your convience.

Revisions will be a work in progress. Sometimes we will get feedback on our designs and people tell us what might make the kart better. If we think they are good ideas they end up in the Revisions page. So feel free to let us know of anything we could improve on and we will post it.

Resources are just some of the internet sites we have found to be helpful.

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		INTRODUCTION				

Here is a list of tools that we used on our first karts.
This list is probably a minimum and any other tools that make your kart building easier would be that much better.

- A truck or trailer. Most of the metal houses carry steel in 20- 24 foot lengths. They will sometimes cut them in half for you for a small charge but even a 12 foot piece of tubing can be hard to get home in moms minivan.
- We are going to need to measure and mark this new metal, so a tape measure and some good soap stone or a silver sharpie will be needed.
- Cutting the metal can be done in a wide variety of ways. I would suggest a chop saw. They are not to expensive and very easy to use. Most of them have a angle guard so you can set it for different degrees when cutting.
- After cutting the metal there is usually very sharp edges. Now you can get a grinder and grind them all smooth or just be very careful with the cut metal till you weld it all together. The welding will melt the rough edges and you wont have to worry about them any longer. Your Choice!
- Some Vice grip clamps are handy to use as extra hands if you are tackling this project solo. Sometimes its nice to have another hand.
- We must hook all this metal together somehow, so a welder is a must. Now using 14 gauge metal it doesn't have to be anything to big but more power is always better than not enough. If you don't weld or have a welder handy, you can always take it to your local welder and have him put it together for you. They might charge a bit but its good work!
- Protective gear is a must! Get some good gloves. Get some good eye protection. Always think safety first. There is no fun in getting hurt.
- Well the rest of the tools should be hanging out around the shop or garage. Socket sets, hammers, pliers, drills and drill bits, wire brush, hand grinder and maybe some painting supplies.
  Well that should get us started. Lets get to work.

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		TOOLS				

Materials Needed

Below are the materials needed to complete all the cutting, fabrication and welding portions of building your new kart. There is a lot more that needs to go on it after it is built such as bearings, tires and wheels,
motor, etc.

35 Feet of 1" X 1" #14 gauge square tubing.

03 Feet of 1" X 1/8" flat stock

06 Spindle Brackets - Part # SC-411300

02 Bearing Hangers - Part # SC-400170

01 Motor Mount Plate 5" X 12" (Needs to be cut to 5” x 10“)
- Part # SC-400367

05 Shock Mount Weldments - Part # SC-300805

06 Feet of 1/8” steel Rod

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		Materials				

Sugested Steps

The order you decide to build these parts is up to you but I would like to give a simple step by step guidline.

1. First start with the Back or sub-frame. That way if you have any adjustments or need new parts you can order those while you finish the front main frame.

2. Then cut out and layout all the flat parts for the main frame. Spend some time making sure it is straight and flat. Make sure and measue "Criss-Cross" to double check yourself. This will help to get it all straight.

3. Weld on the weldments next in the given locations. Steering brackets, shock mount tabs, Bearing hangers, and all the spindle brackets. Once again make sure it is all straight. Make changes needed for your specific

4. Finally Put on all your hardware and remember this is a project and "Plans" only for a kart concept... This is your project so you can change anything! Might want bigger shocks or a different seat or no shocks at all? Just take the time to make it the kart you want... put on all the hardware to make sure it all fits then take it all back off and get it ready to paint. I use Hammered Finish spray paint if I am painting it myself. Have fun!

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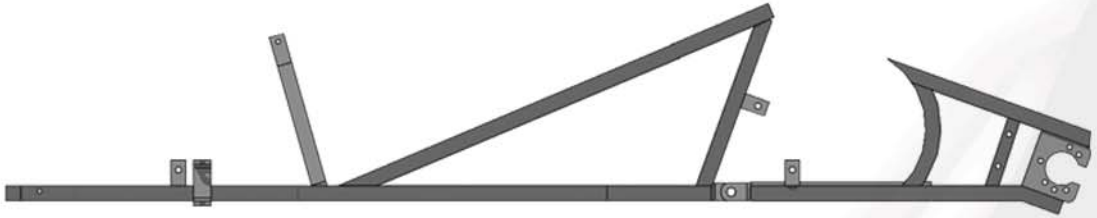
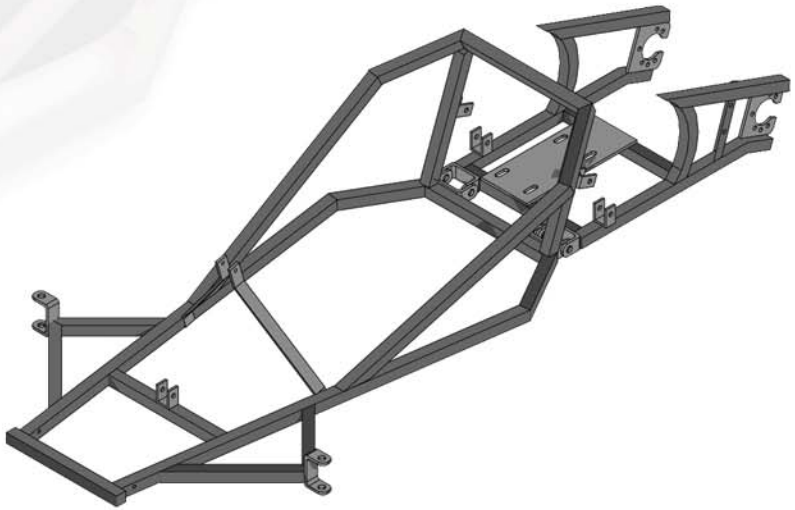
		Steps				





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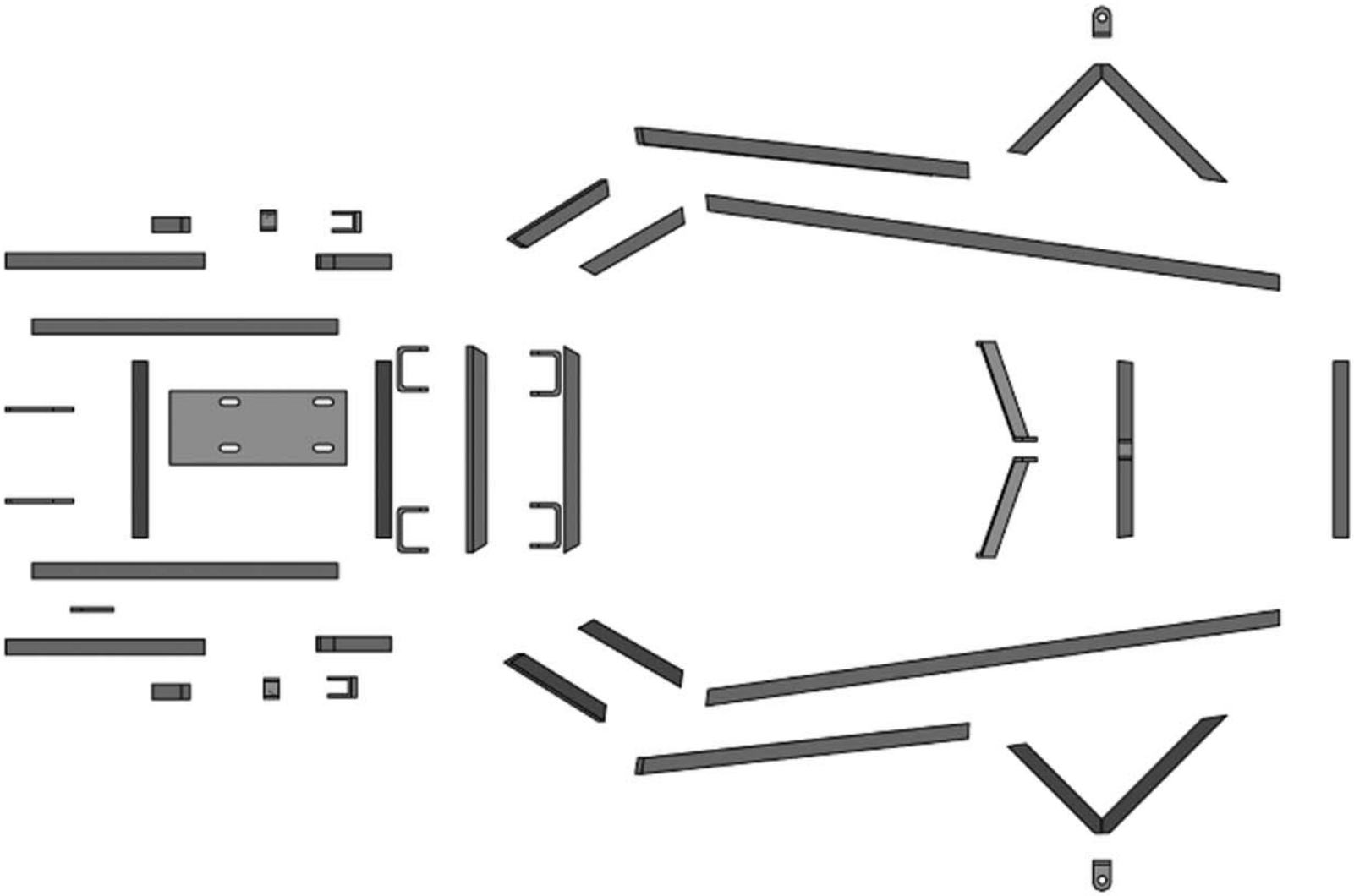
		TOTAL WELD				



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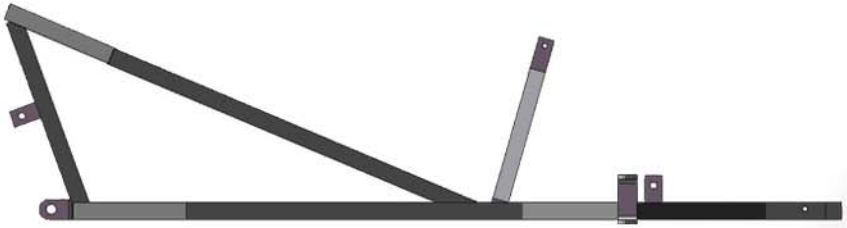
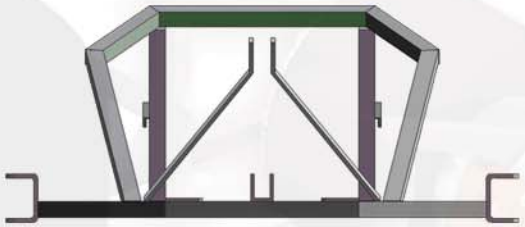
		Exploded View				

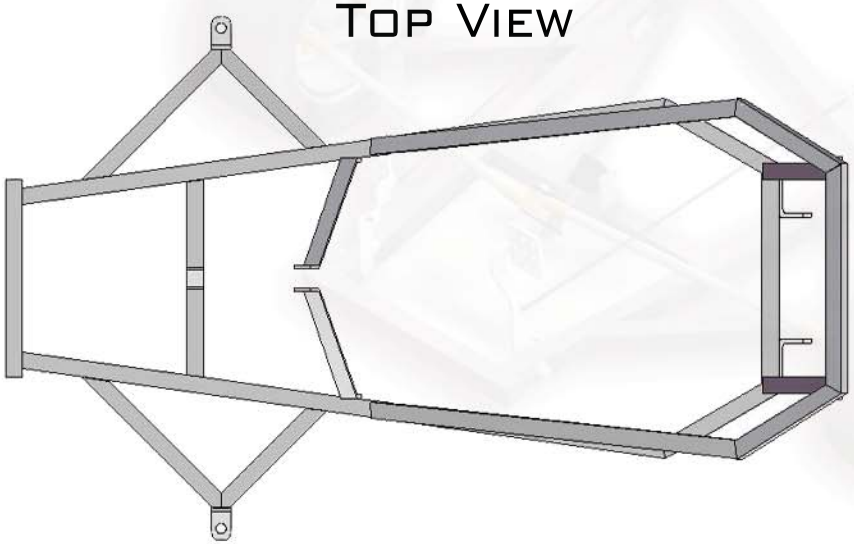
Side View

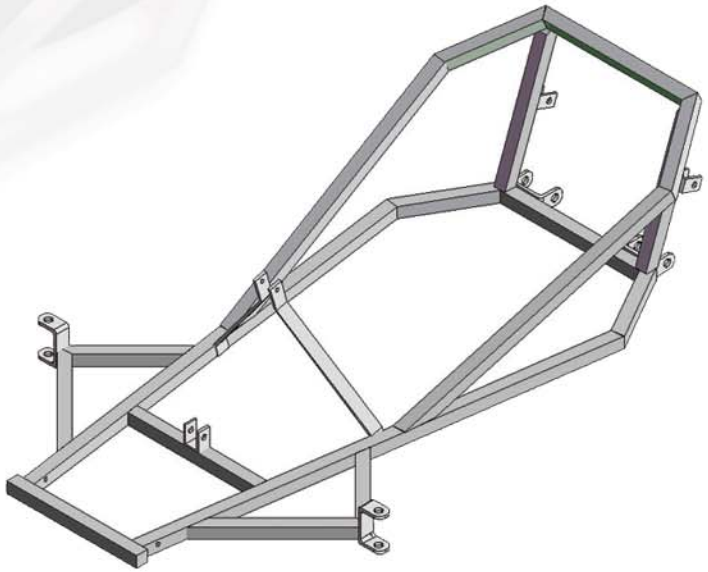


Iso View



Top View





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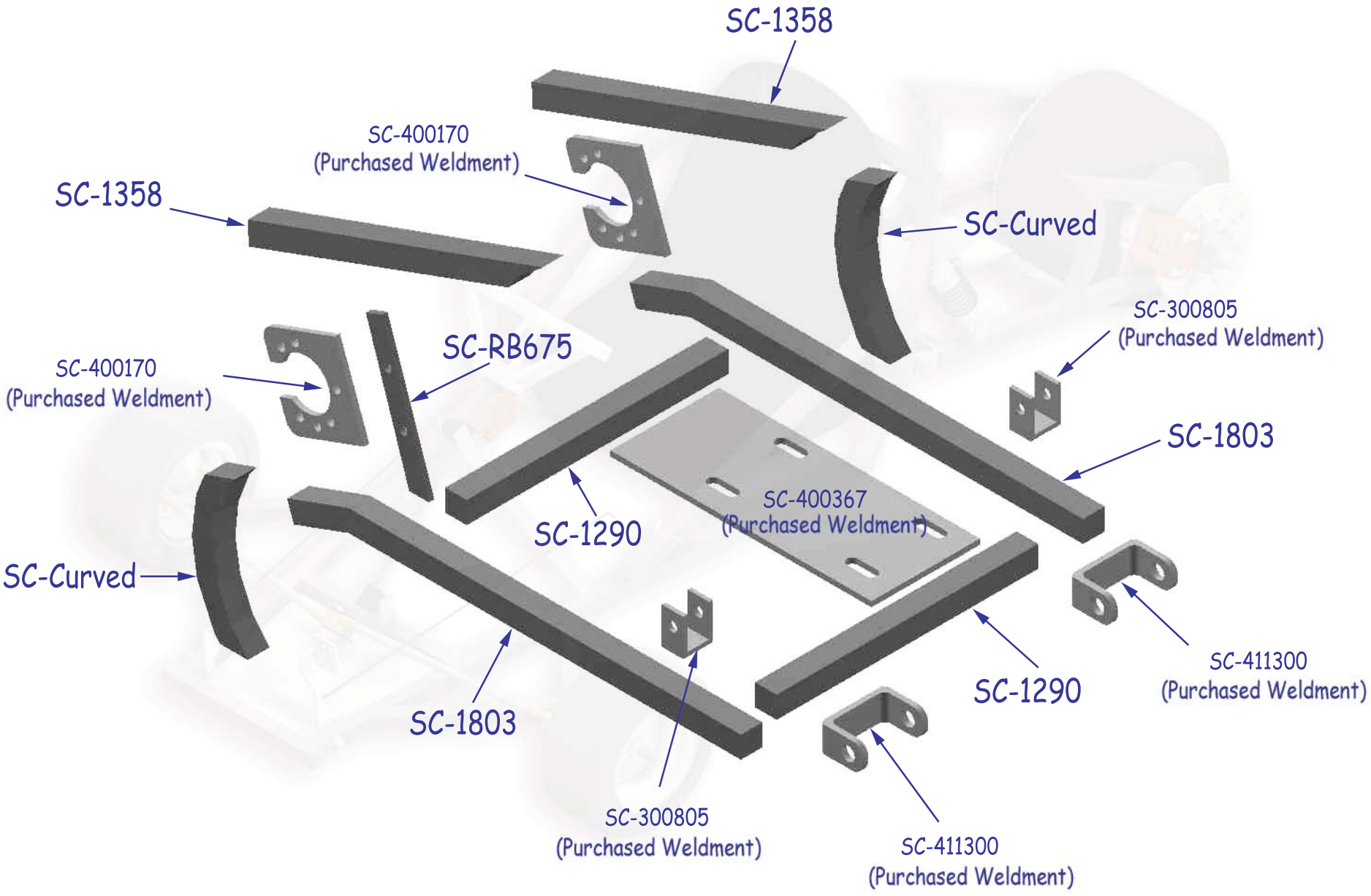
		SC-Sub-Frame			Qty-1	



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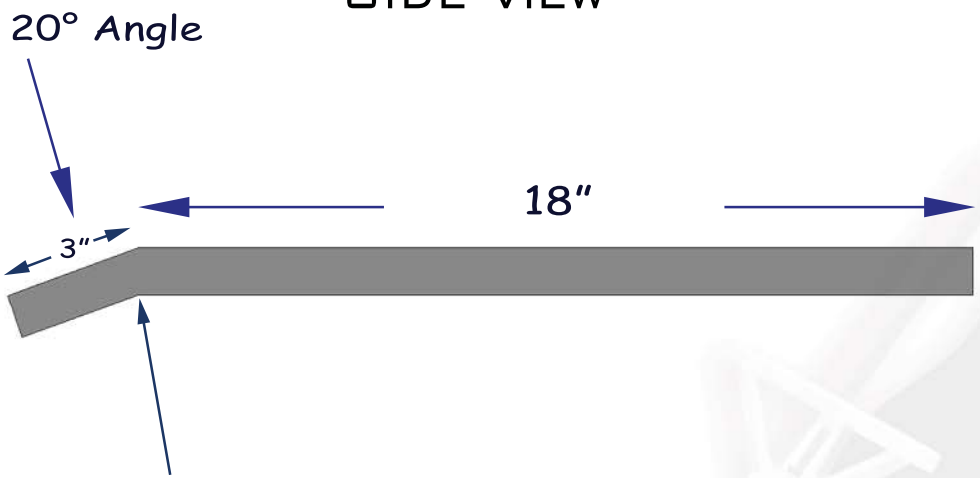
		SC-SUB-EXPLODED			QTY-1	

Side View

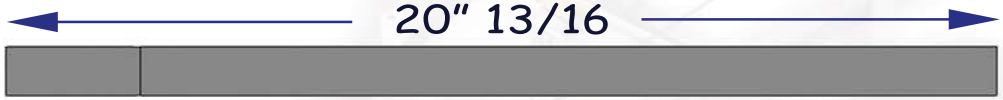


Cut notch here & bend end down as shown. Then re-weld.

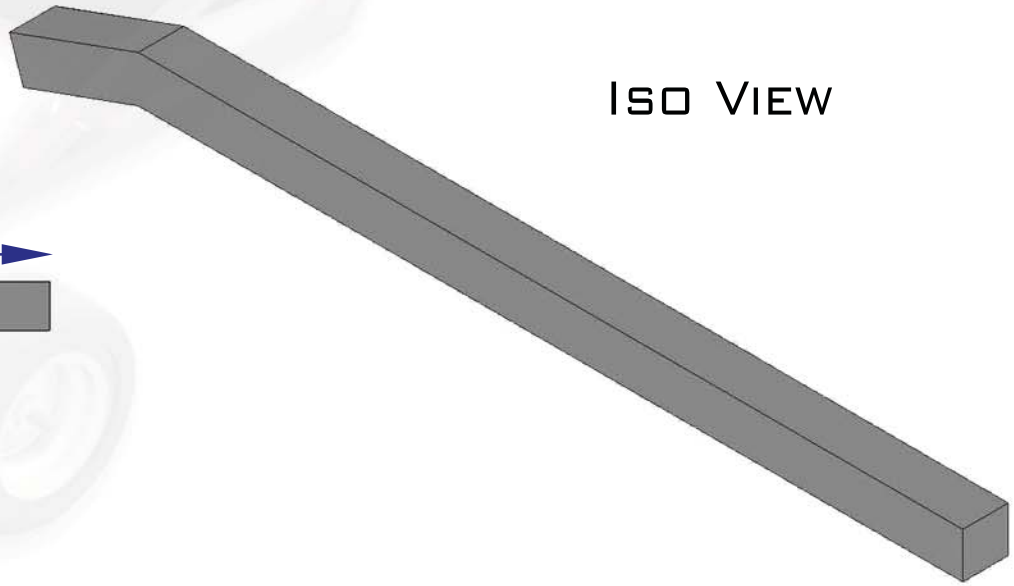
Notes

Okay its time to start cutting. We Will be using the 14 gauge 1" square tubing for most all the parts. Start by cutting a 21" piece with 90 degree cuts on both ends. Then make a mark at 3" from one end and cut a 20 degree notch from the bottom up to the top but don't cut all the way through. Once you have a notch then hammer the notched end down till you get a 20 degree angle and then weld the notch back together. You need to build 2 of these.

Top View



Iso View



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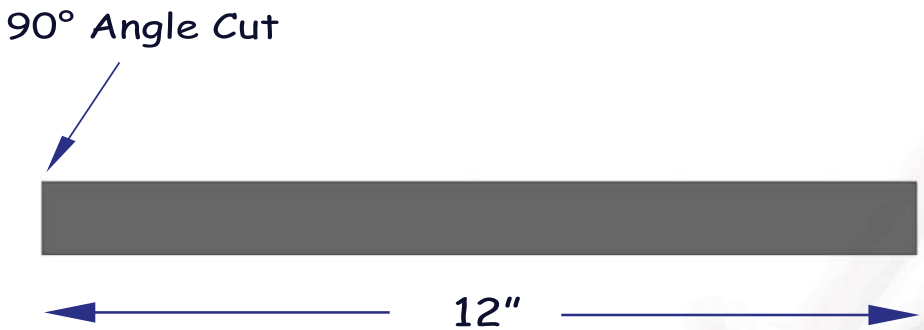
		Parts / SC- 1803			Qty-2	

Side View

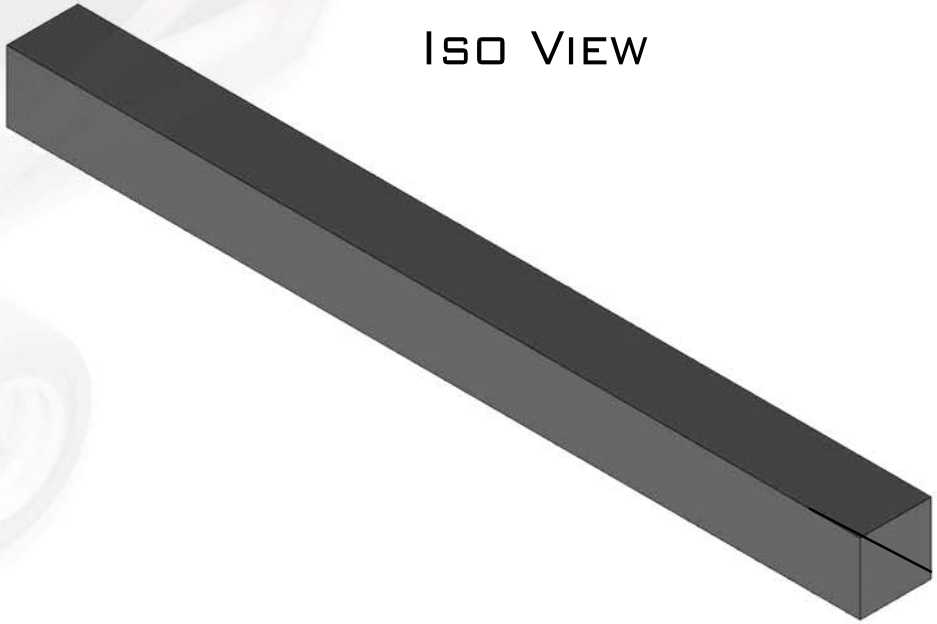


Notes

This is very easy to make, just cut a 90° then measure 12" and cut another 90°. Thats it! you will need 3 of these.
This is Part Number SC-1290

Top View

Iso View



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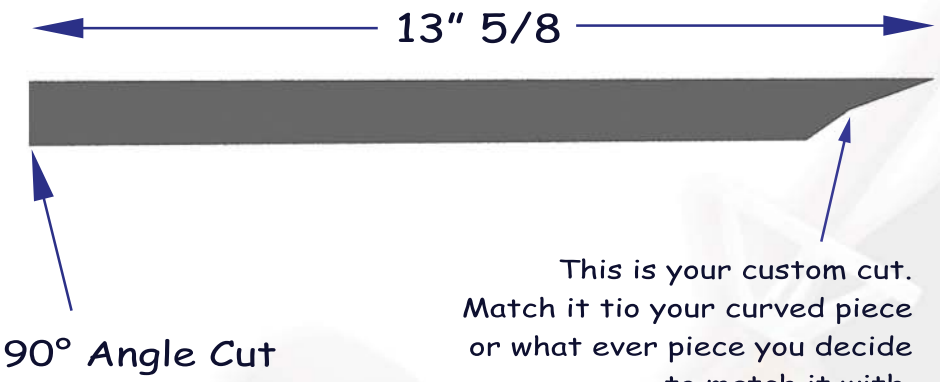
		Parts / SC-1290			Qty-3	

Side View

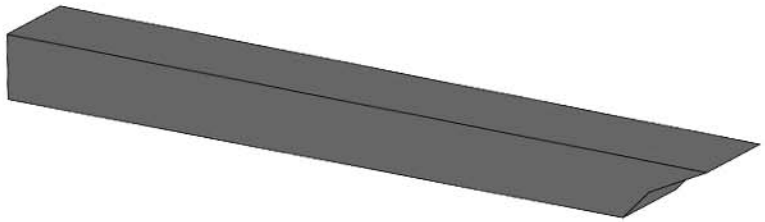


Notes

This part is "very up to you"! I have it shown here with an angle that will match up with my curved part. But if you want to make it easier with a straight cut or a 45° its up to you and how you want your kart to look. I did the curve and this custom cut to match the curve, because I think it looks good. So if you want to do the custom cut for the curve, just make your curved piece first then place it next to this piece and make the mark you need for your cut. Just make sure that the top or long side ends up at 13" 5/8. Look at the "Sub-Frame" on page 15 to see how it fits into the kart and how you might want to change it to suite your design.
You will need 2 of these. Once again use the 1" tubing for this as well.
This is Part Number SC-1358

Top View

Iso View



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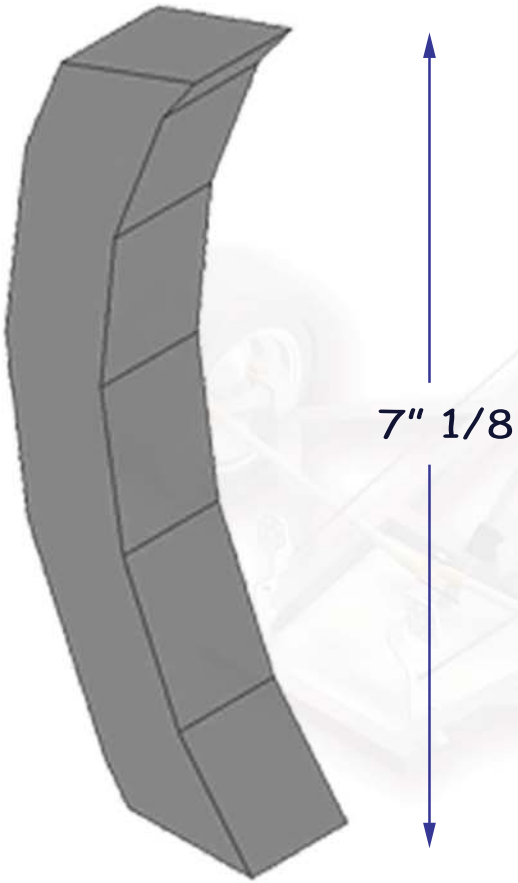
		Parts / SC-1358			Qty-2	

Iso View



Notes

This is the "Custom" part if any on this kart... You can choose to use a straight piece, maybe some cool logo design or what ever you want to put here. The point is that you need to make sure it is a good support for the SC-1358, thats its job! I am showing how I used the 1" tubing to make a curved piece to go in this location. Start out by making a 50° cut the measure 10" from the long edge and make another 50° cut. (not mirrored) (fig.1A) Then make a mark every 2" on one of the sides. (fig.1B) Make a wedge shaped cut at every mark as pictured. Once you have all the cuts you can start to hammer the sections into a curve. (fig.1C) Once this is done you can hold it up to your SC-1358 and make sure they line up and that no matter what it will be 7" 1/8 high at the highest point where they meet. Make any adjustments to your bends then weld it back together. You will need 2 of these.

Once again use the 1" tubing for this as well.

This is Part Number SC-Curved

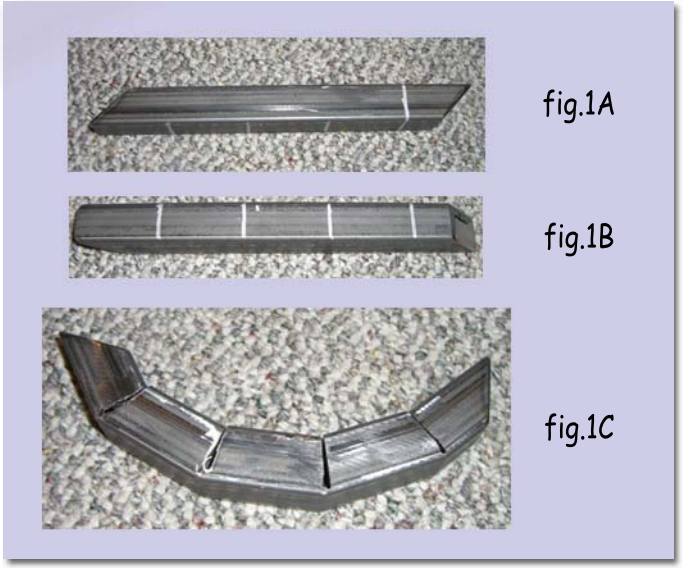


fig.1A

fig.1B

fig.1C

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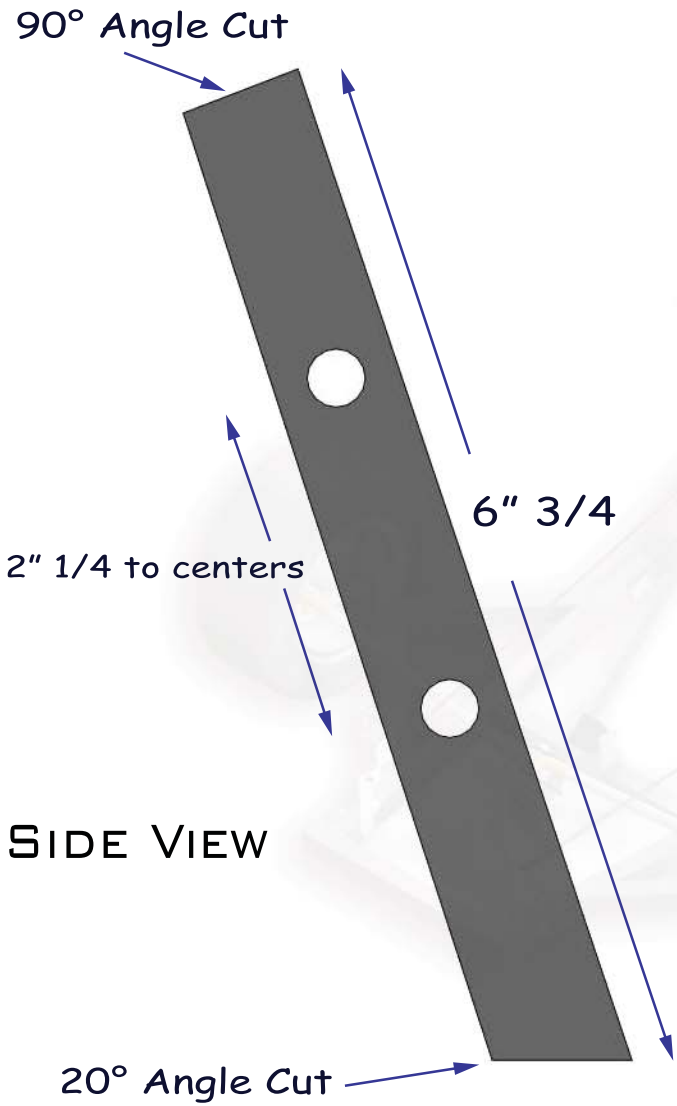
		Parts / SC-Curved			Qty-2	

Notes

This will be the bracket for the rear hydraulic brake caliper. Use a section of the 1" x 1/8 flat iron that is in the material list. The long side is 6" 3/4 long with a 90° cut on one side and a 20° cut on the other. The holes are 2" 1/4 to the centers and should be located where your specific brake fits the best. My caliper worked at 2" from the top to the center of the first hole. You will only need one of these.
This is part number SC-RB675



Side View

Iso View

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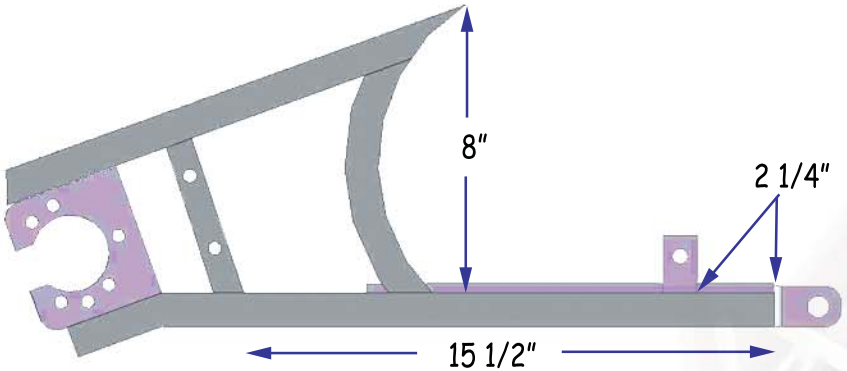
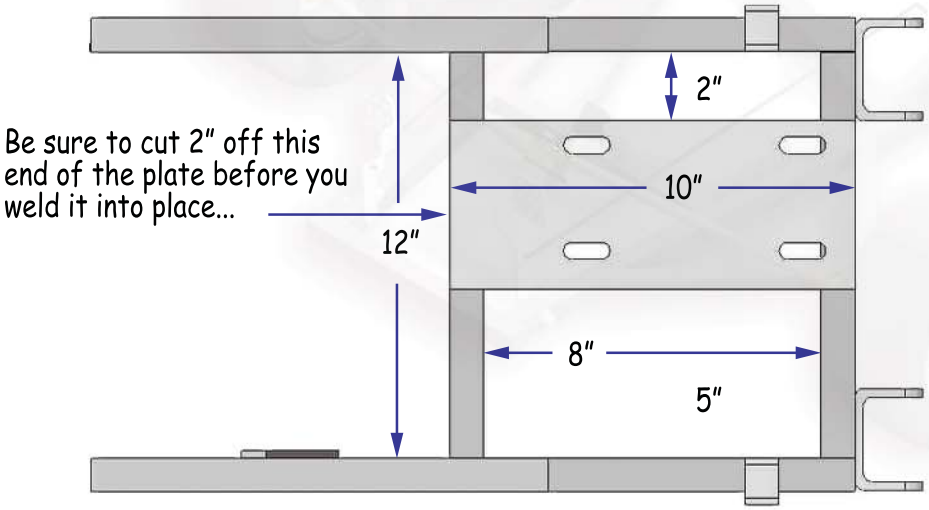
		Parts / SC-RB675			Qty-1	

Side View

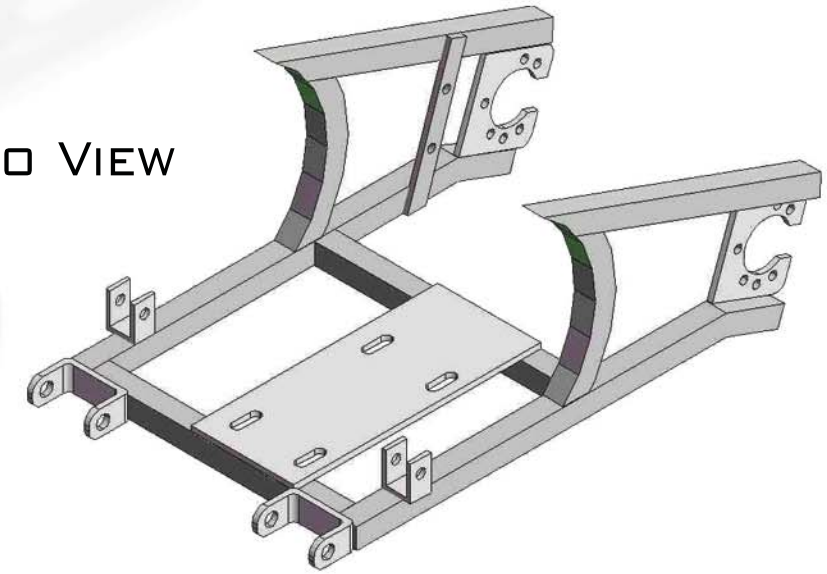


Top View



The rest of the parts are what we call weldments and are purchased with the rest of your hardware. the ones in purple to the left are the weldments.
Start by welding the front SC-1290 between both SC-1803's. Then add in the other SC-1290. Next weld in the bearing hangers SC-400170 to the top and inside of the SC-1803's as shown. Then the SC-1358 and the SC-Curved. Make sure all the way that you keep eveything square and straight.
The SC-300805 shock brackets and the SC-411300 spindle brackets and then the SC-400367 motormount plate. Make sure you notice the way the motor mount plate is fit and get it the same so you dont run into space problems when you mount the motor. I cut 2" off the long end of the Motor mount plate so it ends up being 10" x 5" before you weld it on. I would save the SC-RB675 till you have mounted your hardware and brake disk on the axle to be sure you have the placement and angle correct for the rear caliper then tack weld it into place, remove all your hardware and weld it in for good.

Iso View



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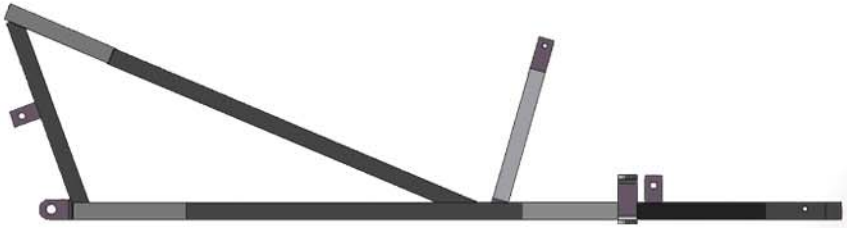
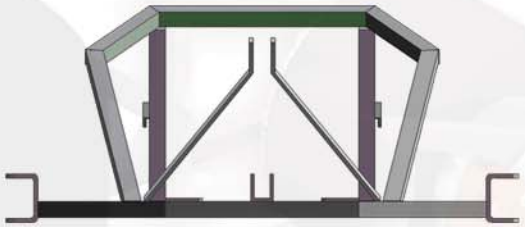
		SUB - MEASURMENTS			QTY-1	

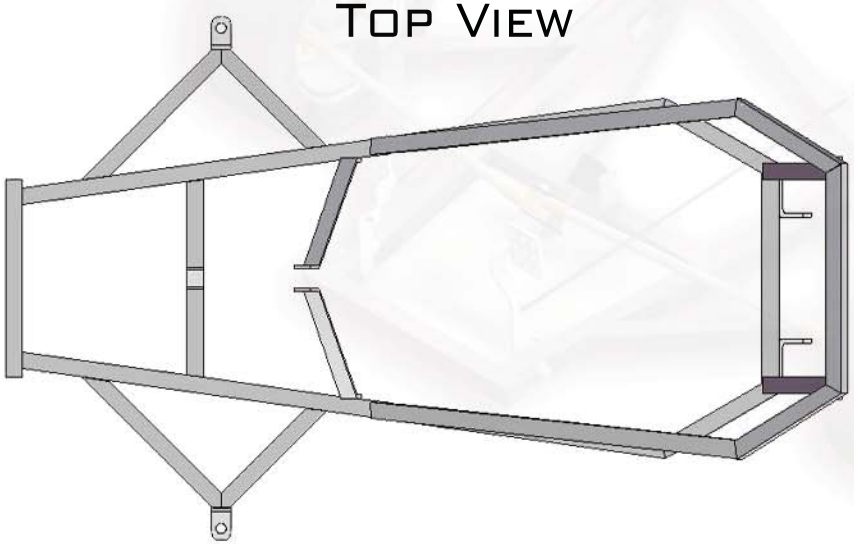
Side View



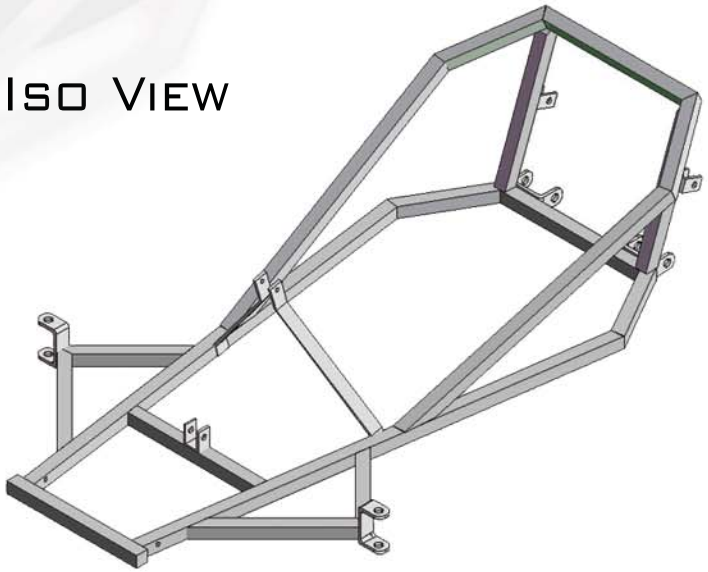
Front View



Top View



Iso View



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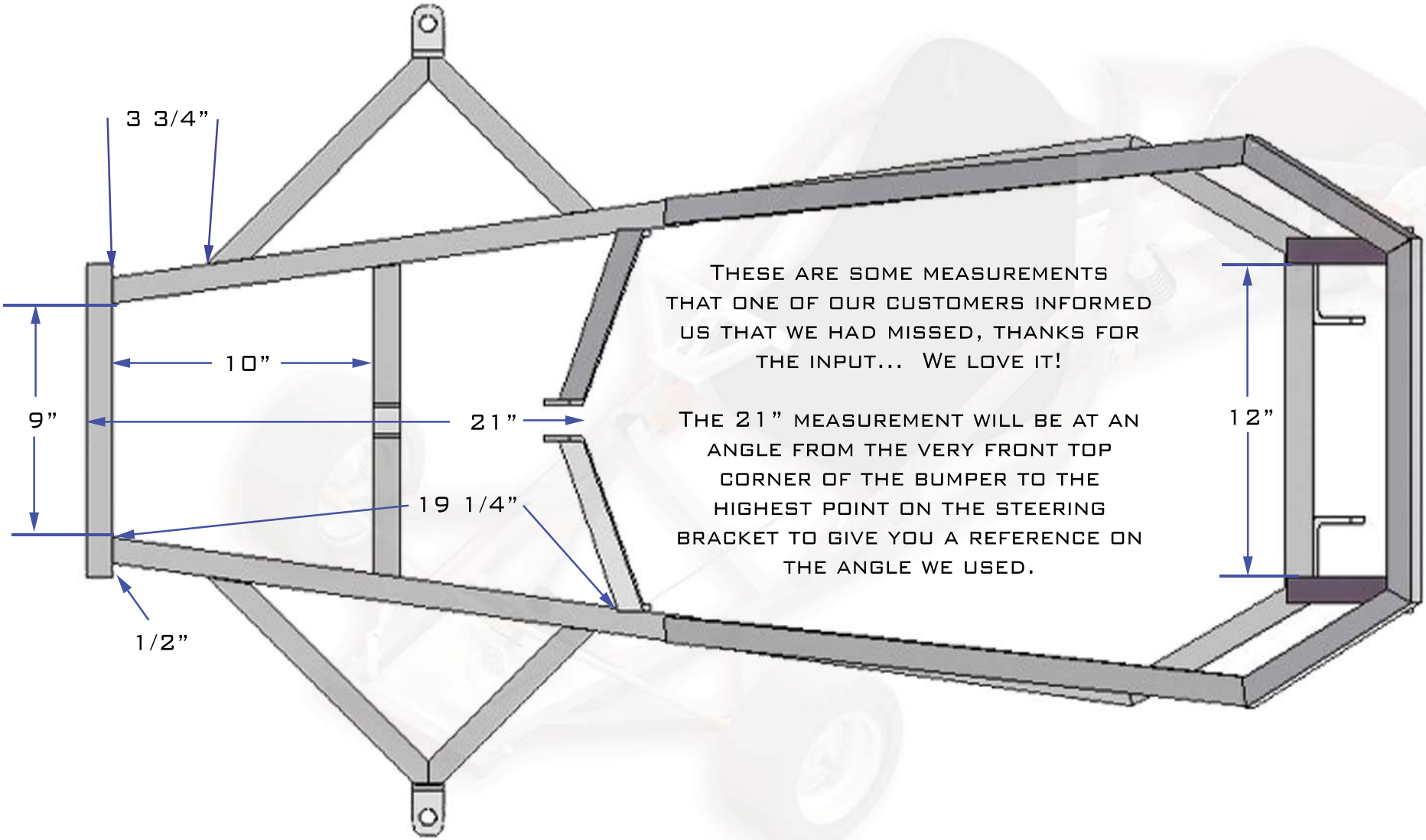
		SC-Main-Frame			Qty-1	

Top View Measurements



These are some measurements that one of our customers informed us that we had missed, thanks for the input... We love it!

The 21” measurement will be at an angle from the very front top corner of the bumper to the highest point on the steering bracket to give you a reference on the angle we used.

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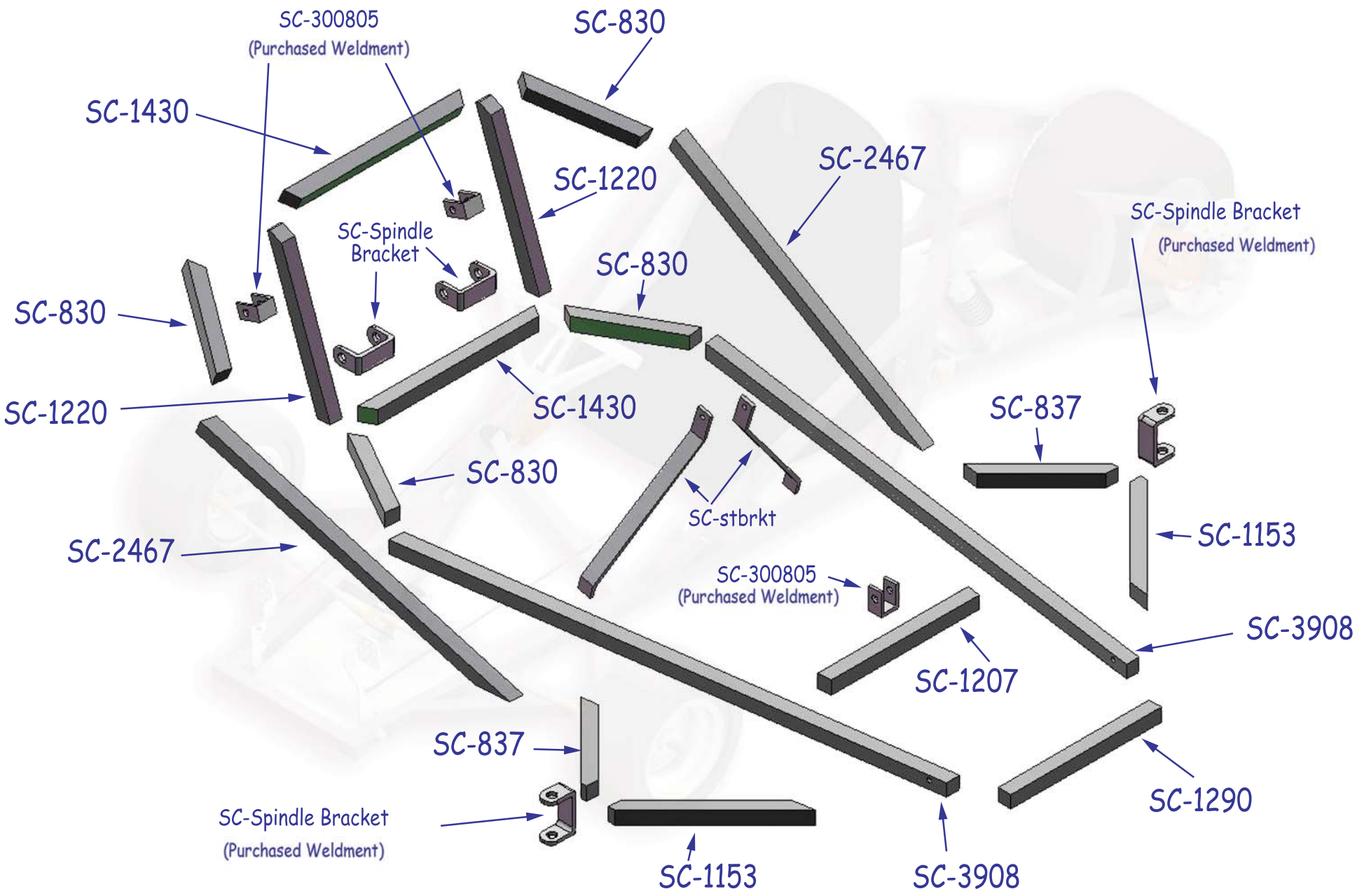
		Main Measurements				



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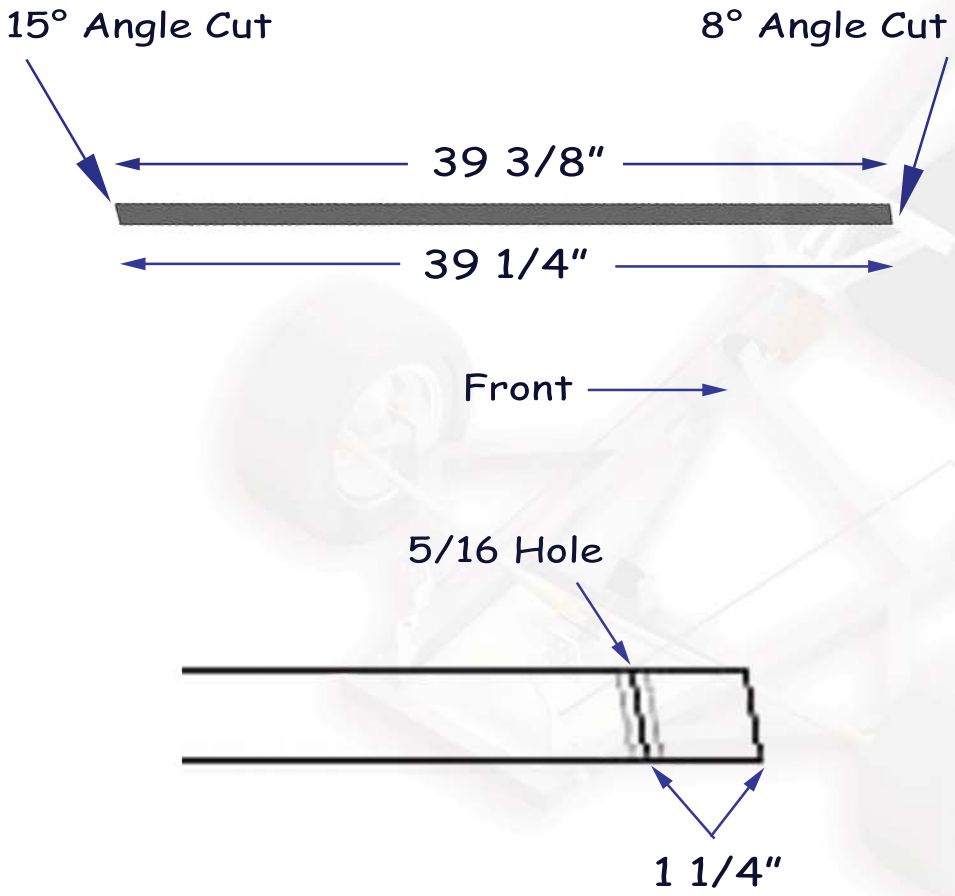
		SC-MAIN-EXPLODED			QTY-1	

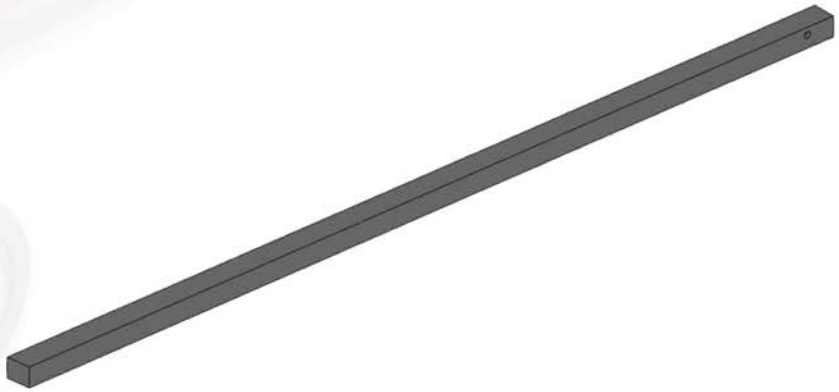
Top View



Notes

This is our longest part, SC-3908. Take a piece of the 1 x 1 inch square tubing and make a 15° cut at one end. Then measure 39 3/8" down the long side of the tubing and make an 8° cut. You will need a 5/16" hole drilled 1 1/4" from the front end of this piece. Make the hole on an 8° slant like the cut. You will need 2 of these.
This is Part Number SC-3908

Iso View



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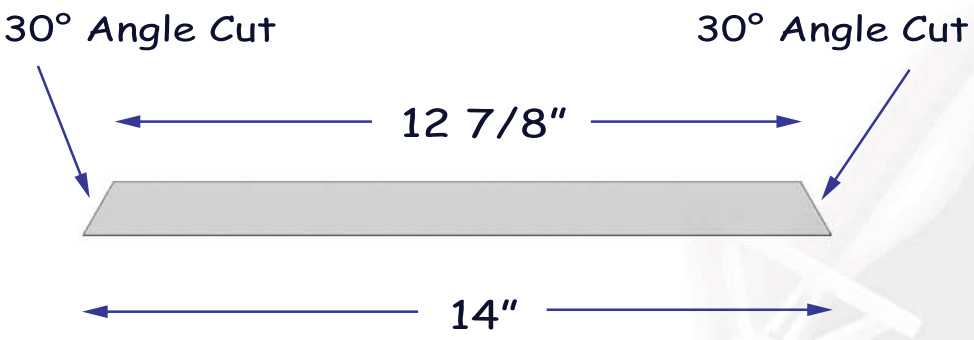
			Authorized	Robert Dicken		
		Parts / SC-3908			Qty-2	

Top View

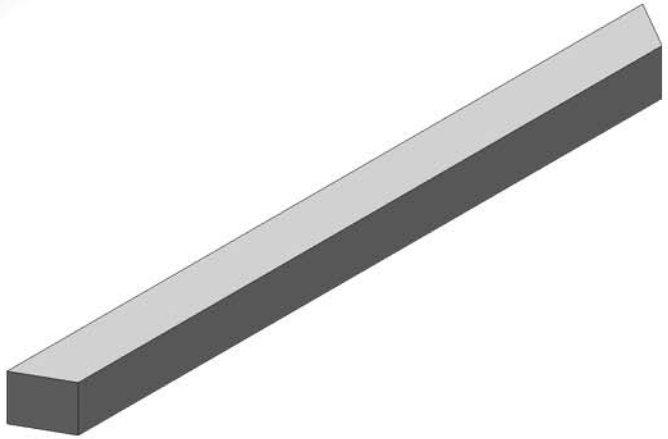


Notes

This is an easy one. We will use this for the back of the main frame. Just cut a 30° then measure 14" and cut another 30° but make sure it mirrors the other side. Thats it!
You will need 2 of these.
This is Part Number SC-1430

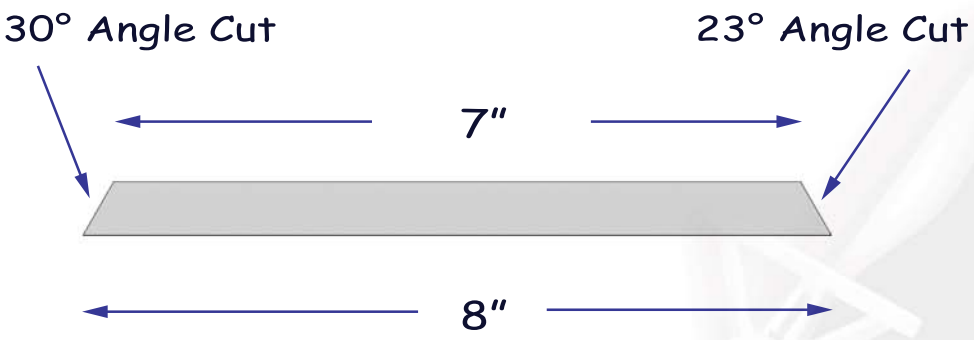
Front View

Iso View



Spidercarts	31		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		Parts / SC-1430			Qty-2	

Top View

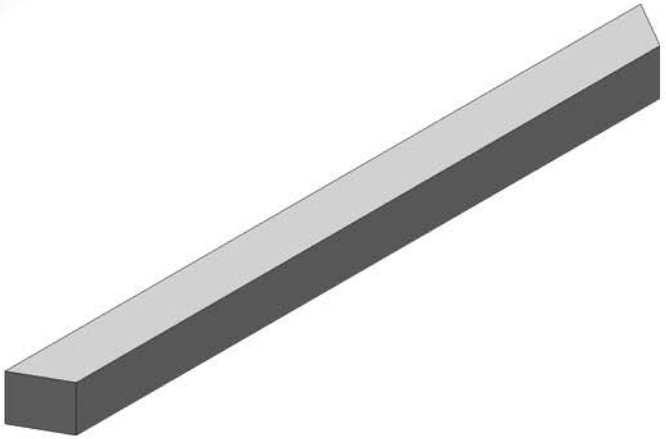


Notes

We will use this for the corners of the main frame. Just cut a 30° then measure 8" and cut a 23° cut. Thats it!
You will need 4 of these.
This is Part Number SC-830

Front View

Iso View



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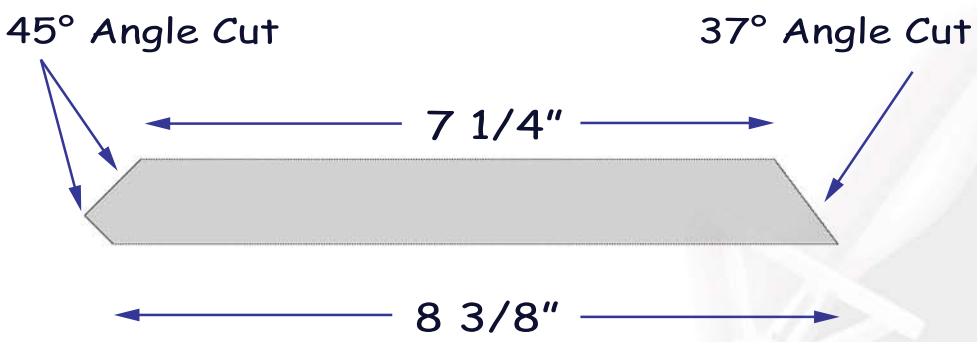
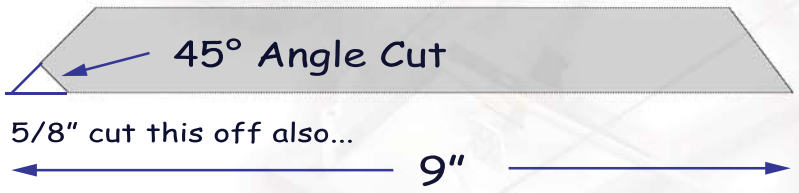
			Authorized	Robert Dicken		
		Parts / SC-830			Qty-4	

Top View

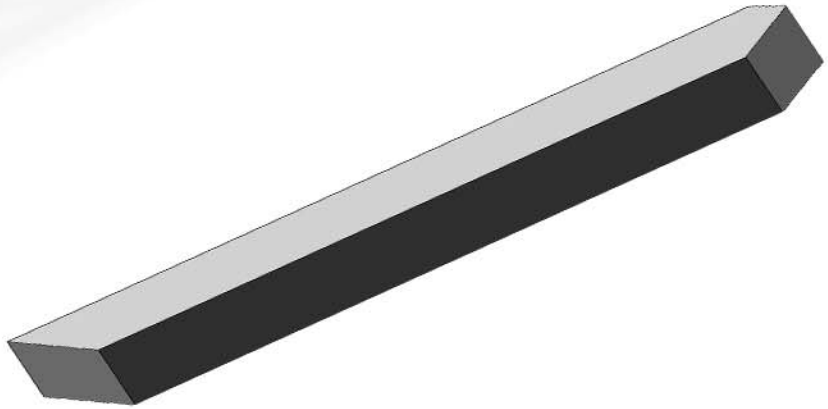




Notes

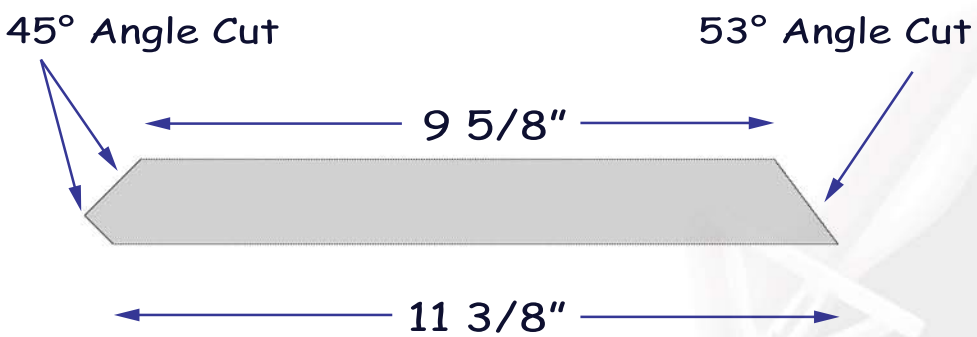
We will use this for the front end support. This one is a bit tricky but easy once you get what is going on. Just cut a 45° then measure 9" and cut a 37° angle mirroring it. Then go back to your 45° side and at a 45° and 5/8" from the end. That was easy!
You will need 2 of these.
This is Part Number SC-837

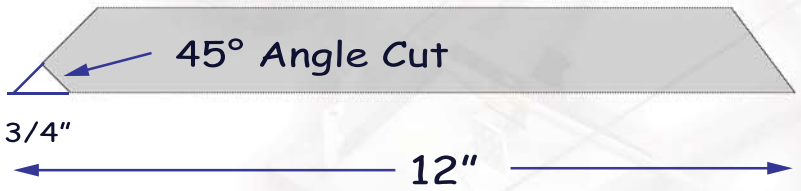
Iso View



Spidercarts	33		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		Parts / SC-837			Qty-2	

Top View

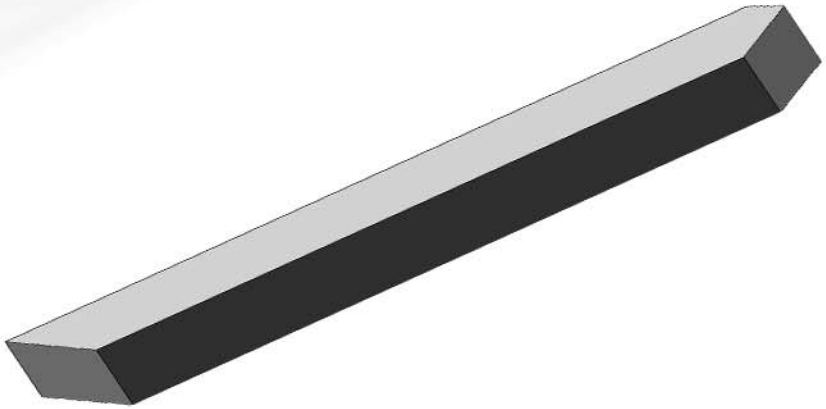




Notes

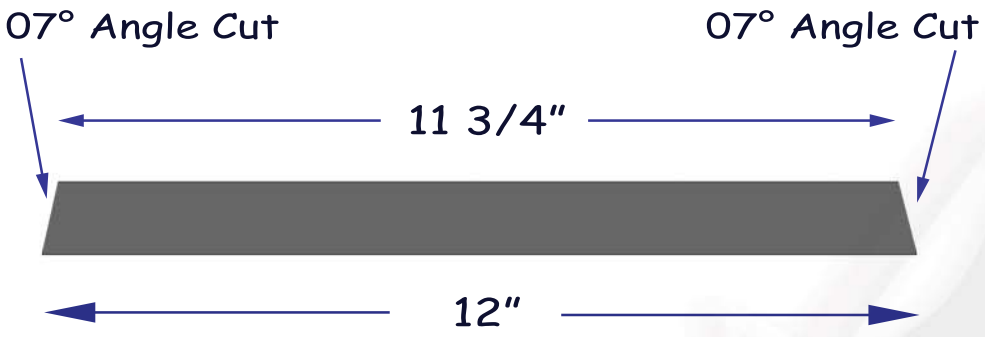
This one is almost the same as SC-837. Just cut a 45° then measure 1" and cut a 53° angle mirroring it. Then go back to your 45° side and at a 45° and 3/4" from the end make another cut. That was easy!
You will need 2 of these.
This is Part Number SC-1153

Iso View



Spidercarts	34		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		Parts / SC-1153			Qty-2	

Top View

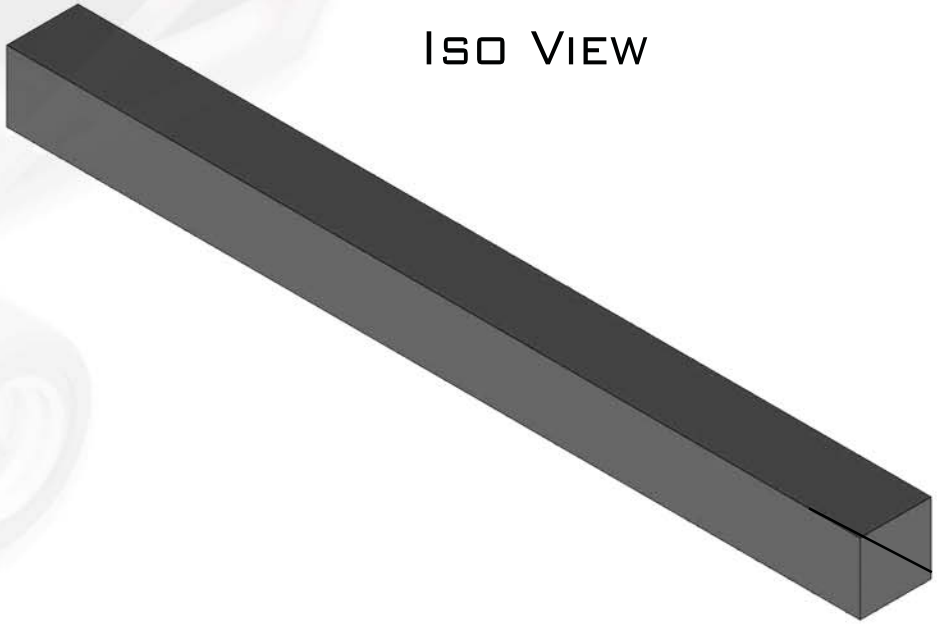


Notes

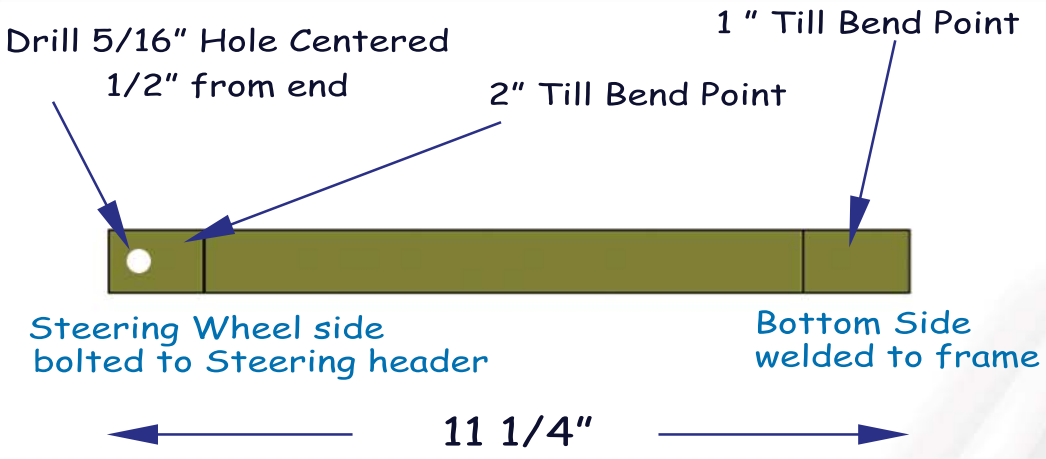
This is very easy to make, just cut a 07° then measure 12" and cut another 07°. You will need to weld one of the shock mount tabs right on center of this one for mounting the steering shaft later. The lower steering block will fit into this welded tab. Thats it! you will need 1 of these.
This is Part Number SC-1207

Front View

Iso View

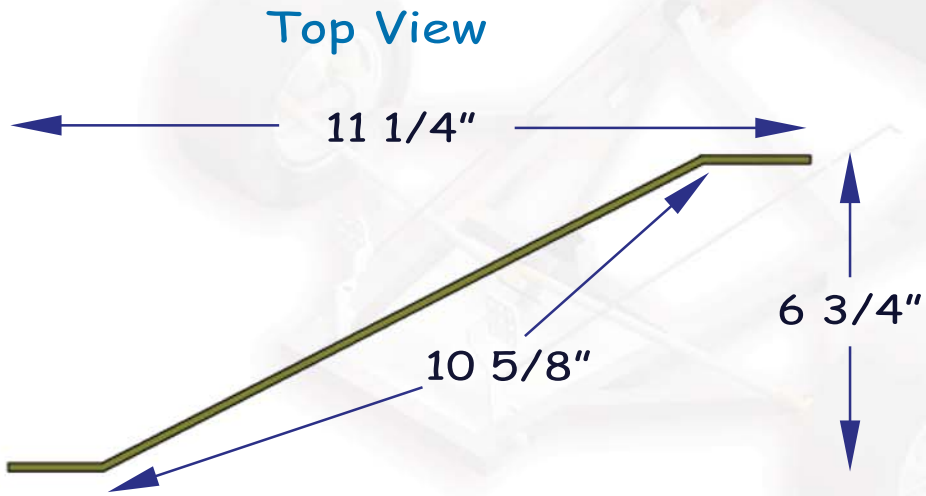


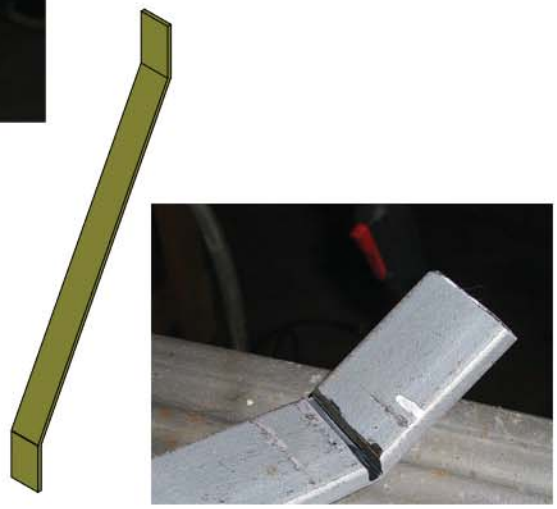
Spidercarts	35		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		Parts / SC-1207			Qty-1	



Notes

Strart with a piece of flat iron and cut it 13 1/2" long and 1" wide and at least 3/16" thick. This will take a bit of fabrication and can be changed to fit your needs. I like to measure my points then cut the metal half way through where I need to bend it. After I bend it I run a weld bead where I cut it to give it strength again. Just a tip that works for me. You will need 2 of these. This is Part Number SC-stbkt





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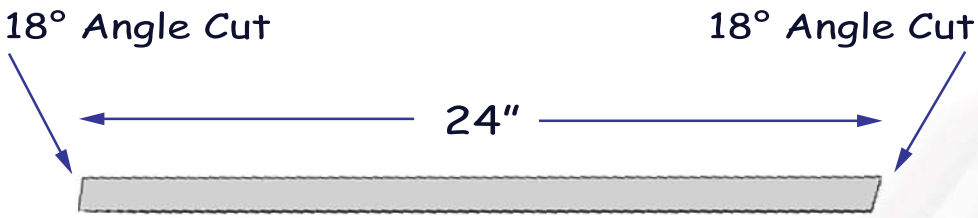
			Authorized	Robert Dicken		
		PARTS / SC-STBKT			QTY-2	

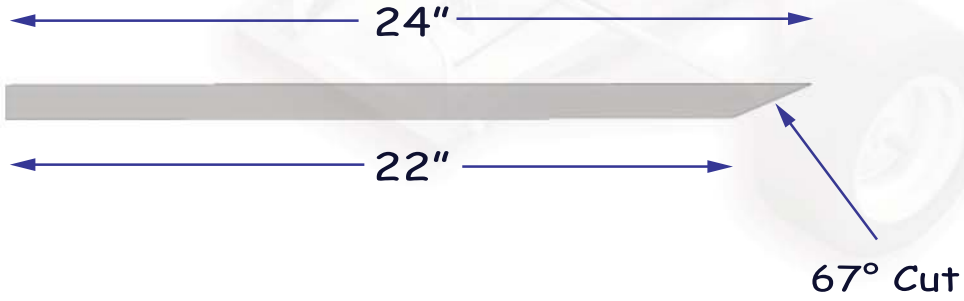
Top View



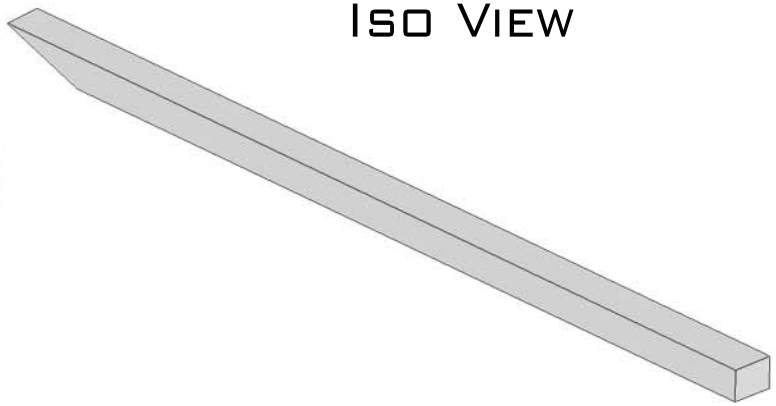
Notes

This is a tricky one as well... So cut an 18° angle then measure 24" and cut another 18° not mirroring the first one but the same way as pictured to the left. Next you need to make a 67° cut from the bottom to the top as shown below. You can use a grinder if needed to get this sharp angle or hand cut it as most chop saws wont do anything over a 45°. These compound angles are very hard to do but if you take your time it will go just fine. You will need 2 of these. This is Part Number SC-2467

Side View



Iso View



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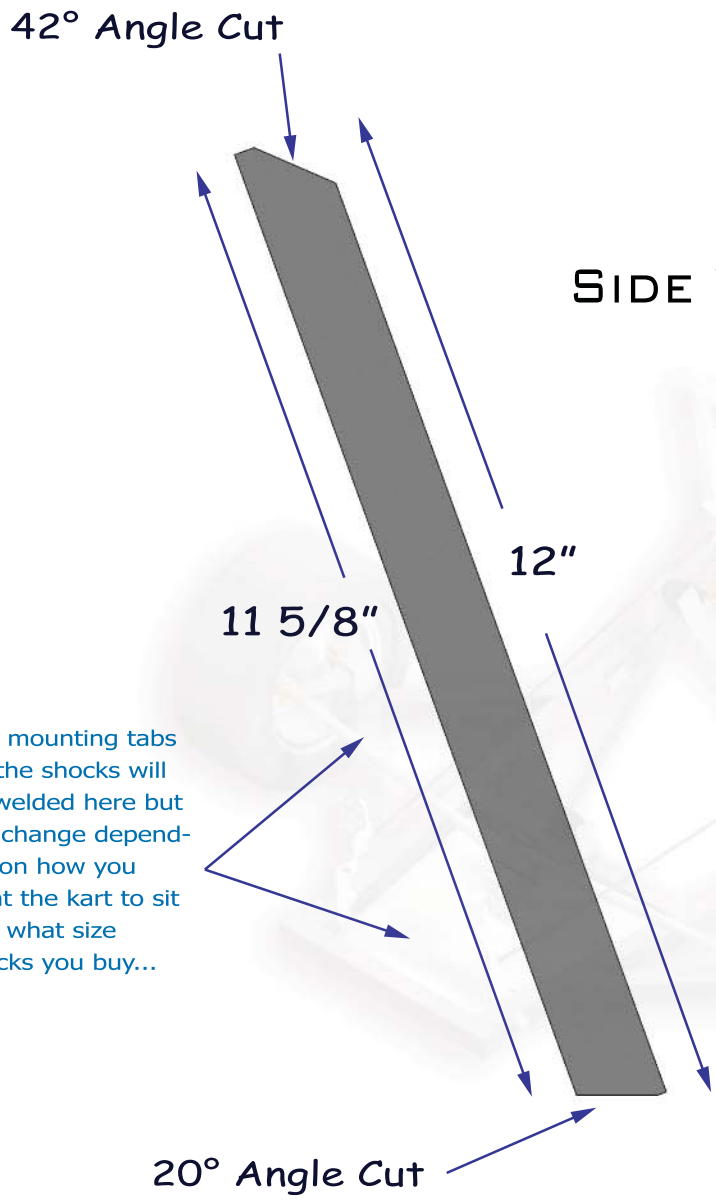
			Authorized	Robert Dicken		
		Parts / SC-2467			Qty-2	

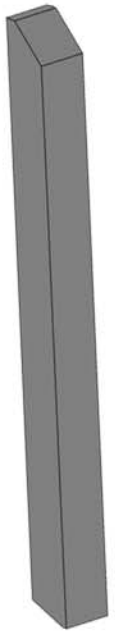


Side View

The mounting tabs for the shocks will be welded here but will change depending on how you want the kart to sit and what size shocks you buy...

Notes

This is your upright for the back of the frame. The shock mounts also are welded onto this upright. So you will start out with a 12" peice of 1 x 1 and cut a 20° angle inward, then measure 11 1/4" from the long side and then cut a 42° angle you should end with a little flat section on top... You will need 2 of these..
This is part SC-1220



Iso View

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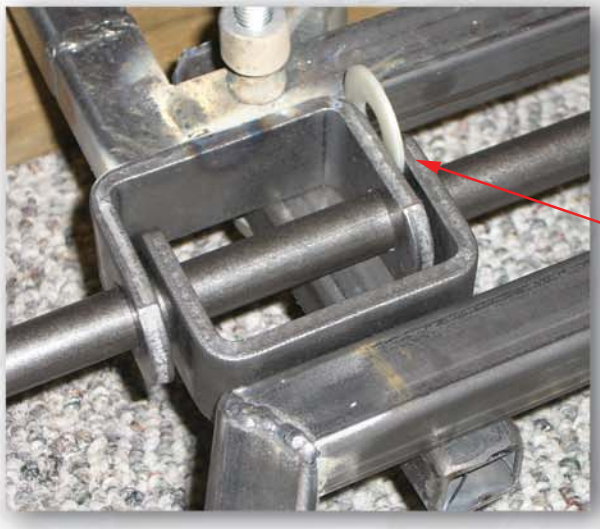
			Authorized	Robert Dicken		
		Parts / SC-1220			Qty-2	

Notes

Setting the Pivot point can be a bit tricky. Using 4 of the Spindle Brackets as your hinges, put your fram on some blocks so it is level then clamp both sides to a sparee piece of metal to keep it firm while you weld. Set everything inplace with a 5/8 metal rod through all 4 brackets to keep them straight while you weld. I would do this step before you add the SC-1220's and the upper sections on the main frame.



I use plastic washers in mine to keep the noise down and keep them from wearing fast. So make sure to put one in the space to allow enough room before you weld...

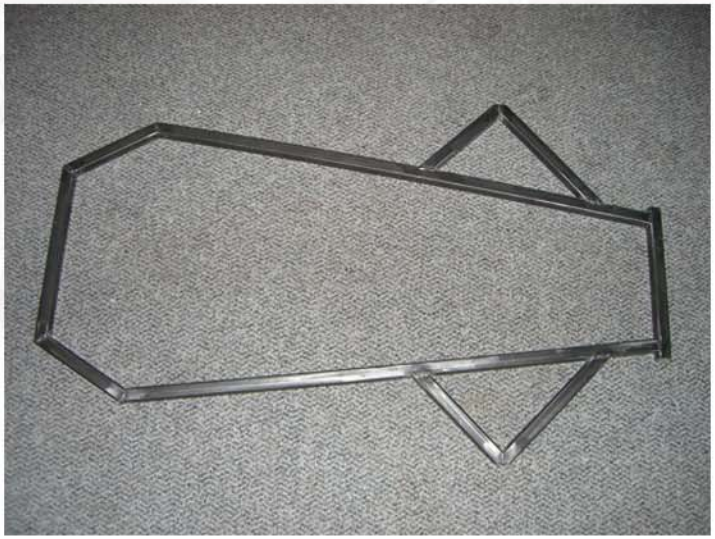
Spidercarts	39		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		Parts / Pivot				












SPIDERCARTS	40		Ver.	0.1.2.6		Copyright is the property of Spidercarts and shall not be reproduced.
			Authorized	Robert Dicken		
		PARTS / PICTURES 1				

SPIDERCARTS	41		Ver.	0.1.2.6		Copyright is the property of Spidercarts and shall not be reproduced.
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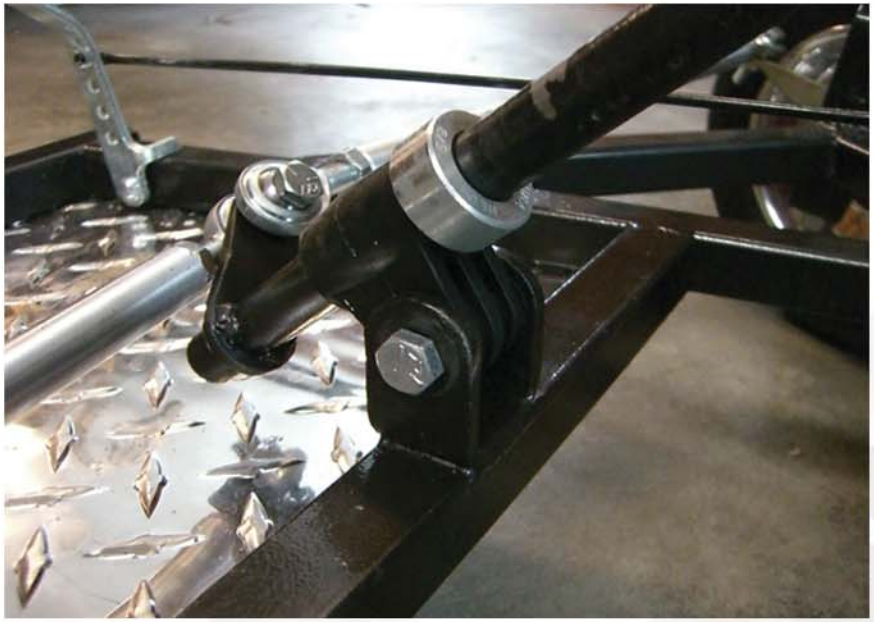
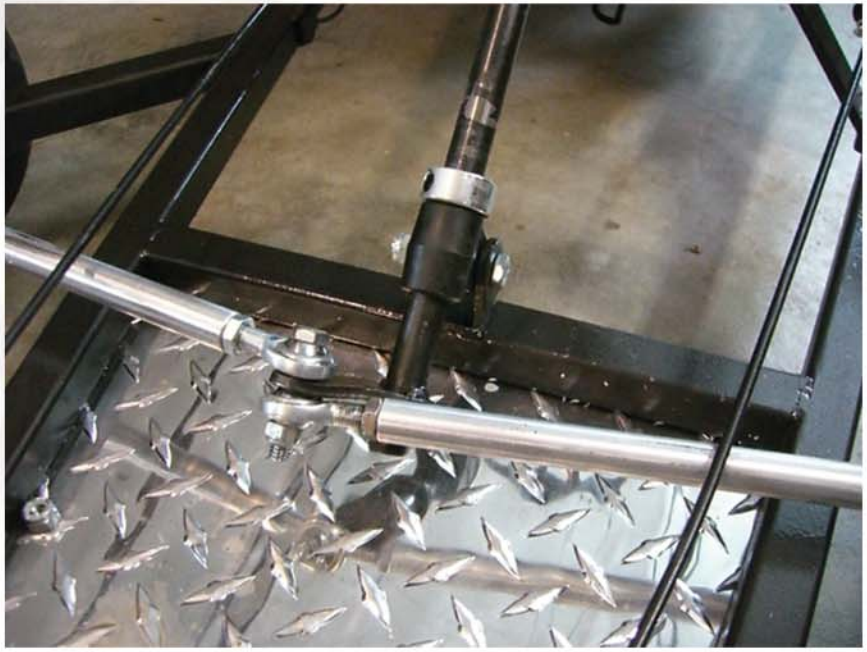
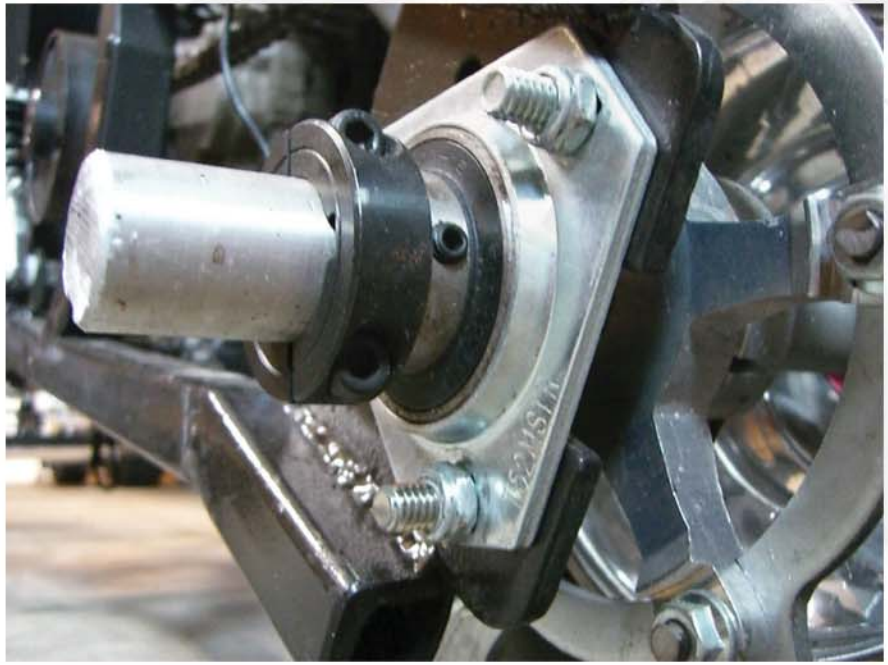
		PARTS / PICTURES 2				

SPIDERCARTS	42		Ver.	0.1.2.6		Copyright is the property of Spidercarts and shall not be reproduced.
			Authorized	Robert Dicken		
		PARTS / PICTURES 3				





SPIDERCARTS	43		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		ASSEMBLEY / STEERING				



The order of assembley from left to right is as follows.

Locking Collar
Bearing Flangette
Bearing
Bearing Flangette
Bearing Hanger (Welded onto the Frame)
Sprocker Hub/Sprocket

Rear Wheel Hub/Wheel/Tire

Bearing Hanger (Welded onto the Frame)
Bearing Flangette
Bearring
Bearing Flangettte
Brake Caliper Hub /Brake Caliper
Locking Hub

SPIDERCARTS	44		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		ASSEMBLEY / REAR AXLE				

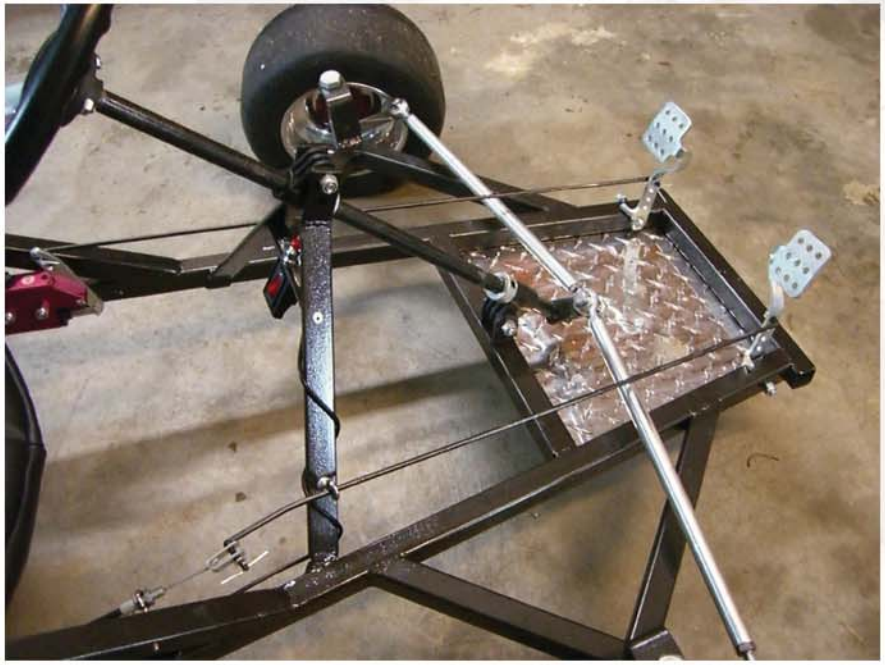
The Hydraulic Brakes and Master are mounted as shown.

I mounted the Master Cylinder just to the left of the seat. Just weld a bracket for it in the little wedge area where the two frame pieces meet. 5/16” bolts hold it into place.

I made my own brake rod. Just use a small gauge steel rod, heat up the ends and bend a 90° in each end and drill a tiny hole for a pin and thats it. When you mount the Master the top hole should be 25 1/2” from the top hole in the brake pedal...

So make your rod 25 1/2” long.

SPIDERCARTS	45		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		ASSEMBLEY / REAR BRAKE				



These picture wil can just give you an idea of how all the front end hardware will install.

The pedals will go into those 5/16” holes you drilled in the SC-3908...

The control rods pictured are just made from some small gauge steel rod and bent to fit...

The Diamond plate I used for the floor pan can be made out of any material you want... Wood, Expanded metal or this Diamond Plate. Just cut it to fit and weld it in place or use screws or rivets which is what I use to keep it into place as it is just a very clean look...

I also riveted in a small piece of metal between the steering brackets to hold switches and the kill button...

SPIDERCARTS	46		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		FRONT HARDWARE				

The picture above is just showing what I used to mount the seat. I used the brackets that came with the bucket seat. I just hammered out the curves they had put in the brackets to hang on a frame then cut them to fit my frame and then welded them into place. This may change depending what seat you use...

The pics to the left show how I hooked up the throttle cable.

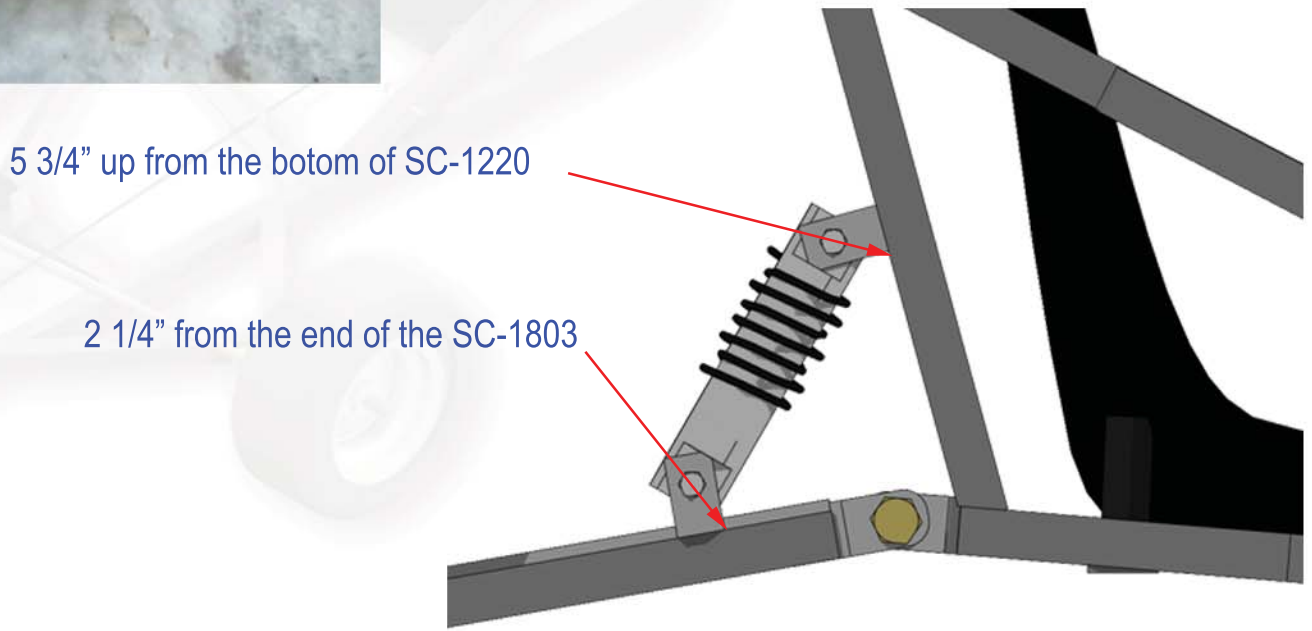
I made a control rod to hook to the pedal as I like the look of having two control rods up front. Then I just drilled two 1/4 inch holes , one in the steering bracket and one in the frame. I then installed two eye bolts. The one in the bracket supports the end of the control rod. The eye bolt in the frame is what I used to attach the end of the throttle cable. Very simple and works great for me....

SPIDERCARTS	47		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		THROTTLE / SEAT				

The Shock mount tabs should be welded onto the frame with the inside of the shock mount flush with the inside of the frame. When you do this the shock mount will extend a little bit out from the frame as shown. But more important is that they are aligned with each other. So the SC-1220 should be right inline with the SC-1803 to make this easier for you when you get to this part...

So the tabs will hang off to the outside just a bit. They should NOT be centered on the frame...

Note:
These Measurements might change if you use different shocks than I have used. Just look at the measurement of your centers on the shocks you are using and adjust this accordingly. This distance will also change how much the pivot is rotated. So if you want it to be a bit more agressive you can move these a bit close to kick it up a little. But remember a little bit goes a long way here....

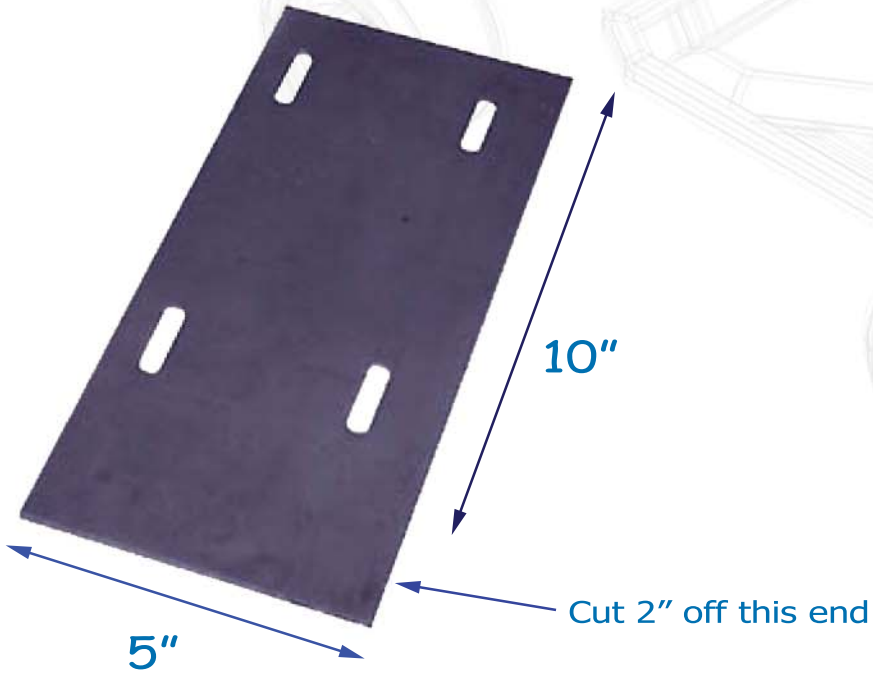


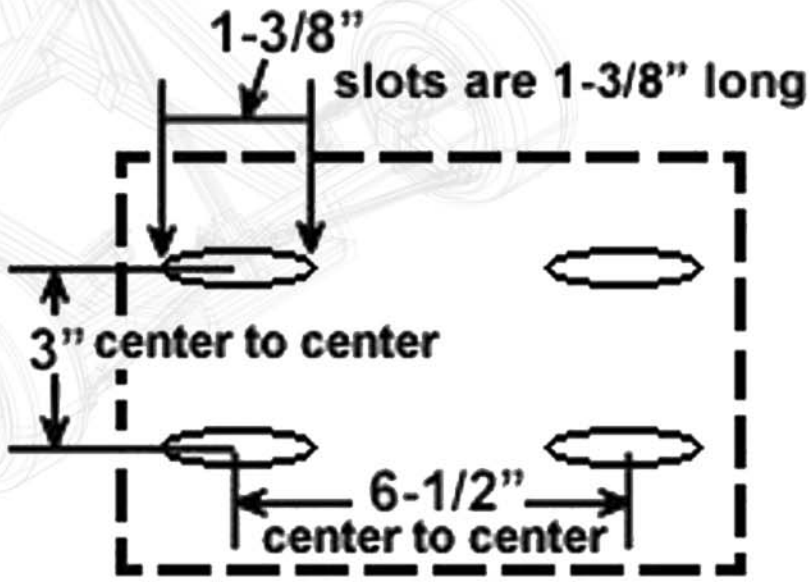
SPIDERCARTS	48		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		SHOCKS				

Motor Mount Plate

An engine mounting plate that allows the engine to be moved back and forth to remove the slack from the chain is needed. Most engines use the same mounting hole pattern. If you are going to make your own, follow the pattern shown in.

You'll need a way to cut the holes in the plate. A jig saw with a metal blade would work. Some have drilled lots of holes and then used files to cut away the rest of the material. A cutting torch would work as well. But buying the plate is often cheaper and much less of a pain. We purchased an 12" x 5" x 1/4" piece of metal in 2005 for $9 locally. A parts house was selling a mounting plate for $7 with pre-cut, pretty holes. If you buy one of the 5 x 12 plates you will need to cut 2" off the long end for this project. You only need yours to be 10"...





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			Authorized	Robert Dicken		
		MOTOR MOUNT PLATE			Qty - 1	

Spindle Brackets

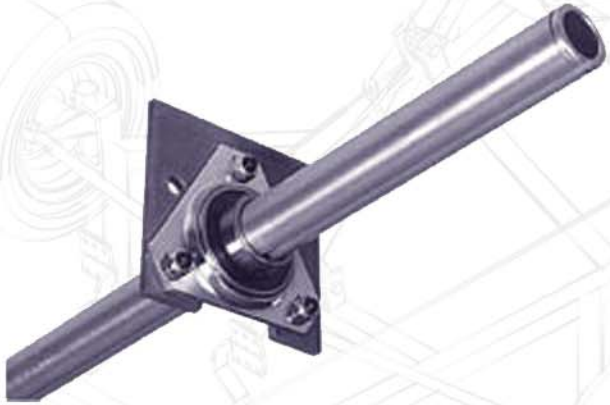
This is another weldment. The spindles are what you attach your front wheels to and the spindle brackets hold the spindles. These are also very cheap to buy as a kit. I would suggest just buying them from a supplier. You can get the entire set for under $40.00.

you can purchase Spindle brackets that are longer and have springs included with them if you would rather... Not really much of a shock but it looks kinda cool!

Spidercarts	50		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		Spindles / R-411300			Qty - 6	

Bearing Hangers

The bearing hangers are so cheap I would suggest just buying them from a supplier. You can get the entire set with the bearings, hangers, and hardware for under $50.00. The hangers are what we call a weldment and get welded directly onto the frame. Then the bearings and hardware bolt right on to the hanger...



Spidercarts	51		Ver.	0.1.2.6		
			Authorized	Robert Dicken		
		Hangers / R-400170			Qty - 2	

Scorpion Parts List

These parts are listed as reference only!

Please make sure the parts you purchase are the ones you need to fit your project as parts and prices may have changed.

Qty	Item	Price	Total	Vendor
2	Douglas 5.0 x 2.5 x 2.5 Polished Wheel	$26.88	$53.76	
1	Douglas 7.25 x 2.5 x 4.75 Polished Wheel	$29.07	$29.07	
2	MAXXIS HT3 10.5x450-6 Tire	$41.40	$82.80	
1	MAXXIS HT3 12.0x800-6 Tire	$59.34	$59.34	
	Vega MAS Oval 10.5 x 4.50- 6 Tires (alternate)	$41.00	$0.00	
	Vega MAS Oval 12.0 x 8.00 - 6 Tires (alternate)	$55.80	$0.00	
4	2 Piece Steel Locking Collar 1" with Keyway	$4.00	$16.00	
1	Kill Switch	$3.00	$3.00	
1	Spindle Set	$32.95	$32.95	
4	Spindle Bracket	$3.50	$14.00	
2	Foot Pedals	$5.95	$11.90	
1	1" Bearing Kit (3 hole)	$20.95	$20.95	
6	Shock Mounting Tab	$5.00	$30.00	
2	Lightened Aluminum Front Racing Hub	$12.00	$24.00	
1	Lightened Aluminum Rear Hub	$10.50	$10.50	
1	Ultra-Lightweight Sprocket Hub - Star	$27.95	$27.95	
1	Go Kart Bucket Seat	$84.95	$84.95	
1	1"High Performance Hydraulic Brake Kit - Billet	$179.95	$179.95	
2	Plastic Steering Block - Lower	$3.00	$6.00	
1	Master Cylinder Frame Bracket	$9.95	$9.95	
1	Steering Wheel 10"	$21.99	$21.99	
1	Motor Mount 12" x 5"	$5.95	$5.95	
1	Keystock	$1.45	$1.45	
1	1" Billet Aluminum Live Axle 18”	$25.00	$25.00	
1	#41 Tooth 3/4 Bore Clutch	$19.95	$19.95	
5	Chain $2.00/ft. x 5ft.	$2.00	$10.00	
1	Steering Shaft Kit 25" (Cut to 22")	$13.95	$13.95	
1	Sprocket #41 54T	$14.95	$14.95	
2	13" Tie Rod Kits - Racing 3/8	$13.95	$27.90	
2	6-7/8" 750 lbs. Shock SHK-678	$16.95	$33.90	Electric Scooter Parts.com
1	Tecumseh 6hp Horizontal,7 Amp Alt / OHH60-71209-Alt	$260.00	$260.00	Small Engine Warehouse
	Total		$1,132.11	

All parts are just suggestions... you can replace any of these parts with your own ideas...
All prices are estimates and are subject to change depending on who you buy them from...

Scorpion Go-Kart Frame

www.spidercarts.com

Online Resources

Here are some of the best place we have found to get the parts needed to finish your kart. All of the parts needed can be purchased from these locations...

www.bmikarts.com

www.gokartsupply.com

www.mfgsupply.com

www.jackssmallengines.com

www.gokartnminibikeparts.com

Revised: 02/23/08..

Thank you for your business.

I hope you have found these plans to be helpful and complete.

Building go karts can be a very rewarding hobby.

As always please use caution when riding your new go kart and be safe.

Please check back with our website as we are always adding new products.

The Scorpion

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			Authorized	Robert Dicken		
		THANK YOU				