

Congratulations on your purchase of the 2008 Ultramax Element. The Element will propel Ultramax into the next evolution of chassis manufacturing. This Tutorial will guide you into winner circle, and make your 2008 Element a success. We @ Ultramax strive on helping our Customers be successful, feel free to contact us anytime, and always keep in mind there is no dumb question. Thanks again for choosing Ultramax and Good luck in 2008 and Beyond.

FROM THE FACTORY

Your 2008 Element will be packed with all the necessary components to assemble your chassis. The list below will assure that you have everything needed.

- *Seat Struts w/ bottoms and hardware*
- *Seat*
- *Steering wheel*
- *Steering hub kit*
- *Steering Fairing w/ bracket*
- *Ultra Mount*
- *Body*
- *Body Mount Hardware*
- *Lock Collars (2)*
- *Throttle Cable / Kit*
- *Throttle Housing*
- *Seatbelts (Champ)*
- *Decals*
- *T-shirt*

******Note this may vary depending on the Package you have Purchased******

CHASSIS MAINTENANCE & TIPS

In this section we will discuss the importance of a well-maintained chassis. These tips can be the difference between winning and losing due to non-sense failures.

- *Locktight all wheel / gear studs to insure no stripping of the wheel nuts and / or studs backing out when using an impact wrench.*
- *Bearing Maintenance is a critical part of your chassis performance. Always blow the bearings out with compressed air after washing, apply WD-40 or any (water dissipater) to bearings and chassis to get rid of moisture.*
- *Always keep a check on the bearings, hubs, and all rotating / moving parts on your chassis to eliminate any failures that could cost you a win.*
- *Keep a close check on the Nerf bars, Bumpers to ensure that there is no chassis bind, make sure the components stay free-floating in the chassis.*

- Re-square the chassis each week. Most front-end adjustments tends to affect the Toe-end.
- The 2008 Element will require 5-7 links to be added to a standard size chain

SEAT MOUNTING AND LOCATION

This process could be one of the most critical steps in making your 2008 Ultramax Element a success. The seat holds the driver and the driver is the most single biggest piece of ballast placement on the chassis. The placement of the seat controls a large portion of weight transfer. The type of seat used is very important, and we recommend using a heavy-duty seat with a large strong lip around the edge to ensure minimal flex. Every Driver has different size characteristics: short, tall, big, and small. With every case seat positions and location are different. In this section we will discuss the proper way to mount a seat.

Keep in mind the driver needs to be comfortable on his/her chassis. The seat can be mounted on the kart stand without wheels & tires by taking a 4ft. level or a piece of plywood, clamp it to the center section of the chassis, and let the seat rest level with the bottom of the main frame rails. If your chassis came equipped with a rear floor pan, we recommend putting a piece of cardboard or a number panel under the bottom of the seat to get it flush with the frame rails.

The first step in mounting the seat is to place the right seat strut on the rear cross member and snug it up enough to hold it in position. Make sure you can still move it across the cross member. Secondly, loosen the front seat slides and push them forward out of the way of the seat. Place the front of the seat in the center section of the upright about 1/8" off to the upright. Push the slides back to the seat and mark your holes for drilling. Keep the slides straight up and down, and after drilling the holes, place 5/16 shcs bolt through, place a rubber grommet and nut and secure the seat. Never tighten the seat down and squash the grommet. With the seat slides still loose, position the seat, the center of the back of the seat in line with the rotor (for Bigger Guy) and we recommend setting the center of the back of the seat 1/2" to 1" to the right of the rotor for all other size drivers.

The seat height greatly depends on the size, weight and height of the driver, and also the type of track. The WKA mandatory seat height is 14" off the ground, but 8 3/4" off the axle will let you achieve this measurement. The guide below will let you see where your seat height should be with your size.

Track Type	6' and above, 150lbs and above	Below 6', 150lbs and above	Below 6', below 150lbs
Pavement	8 1/4" from axle	8 1/2 from axle	8 3/4 from axle
High speed/ high bite dirt	8 1/4" from axle	8 1/2 from axle	8 3/4 from axle

High speed/ medium bite dirt	8 ¾" from axle	9" from axle	9 ¾ from axle
Low speed/ medium bite dirt	9 ¼ from axle	9 ¾ from axle	10" from axle
Low speed/ low bite dirt	9 ¾ from axle	10 ¼ from axle	10 ¾ from axle

As, always this, chart is only a guideline. There are several variables to mounting your seat so the ballast transfer will work correctly; however, with the chart above, you should be able to correctly position your seat for most track positions.

Now that you have your seat height determined, mark and drill the right side seat strut while maintaining your designated seat height. After you have the hole drilled, place the 5/16 button head bolt through the seat, place the rubber grommet between the seat and the strut, add the flat washer and nut, tighten the nut, but don't squash the rubber grommet. Re-check your designated seat height and slide the left strut to the seat. Keep the seat level from side to side, then mark and drill the hole. Repeat steps as you did on the right side strut. We recommend the seat to float between the struts and slides to eliminate any kind of bind between the seat and the chassis.

WIDTHS, SPACING AND HEIGHTS

The width, spacing, and ride heights are also very important to the performance of the chassis. In this section, we will be discussing the correct way and why these parameters are so important.

WIDTHS

The width of the chassis will affect the chassis handling characteristics, transfer and speed through the corner. The rear width is very crucial. We recommend 39.125" to 39.375" rear tread width for pavement and dirt racing surfaces. We accumulate this measurement by measuring the contact patch of the RR and LR, outside edge to outside edge. We recommend the RR wheel/tire to be ¼" off the chassis hanger with the LR moved accordingly to achieve the designated tread width. The wider the LR wheel, the closer the tire/wheel will be to the chassis and you will still have your designated tread width. We usually use an 8.250 LR wheel for dirt application and a 5.500" or 6.000" for pavement. The wider the rear of the chassis is, will make the chassis looser. The wider the front the more it tends to tighten the chassis during cornering. With our experience the RF hub should have a ½" spacer behind the hub and the LF hub with a ¼" spacer behind the hub. These settings should be the correct front tread width for most track and conditions.

RIDE HEIGHTS

Ride heights of the chassis is something that most racers never think about, since we have a lot of adjustability designed into the chassis. Over the years, we have found that keeping the chassis heights, pivot points, and rake of the chassis parallel and plane to the track and surface will let the chassis flex, transfer the weight correctly, and roll free without any chassis bind. In the past few years, the higher cross settings has the chassis bound up as it sits neutral/idle. There are a lot of variables that go into this, and also a lot of time spent to keep your chassis plane. The process that we have used and, seems to be the best way, is to prepare the chassis to a race-ready trimmed out chassis, all scale and geometry settings done, with a fresh set of cuts or tires. Without the steering locked, push the chassis on a level floor as you would in the grid at the track. Make sure it rolls freely and rolls without any kind of bind. A plane chassis that is set correctly will roll for 6-8 ft. and gradually turn left. A chassis with the ride heights and pivot points not plane will tend to turn left real quick and cause the chassis to bind while turning. The adjustments can be made by adjusting each corner with small adjustments and getting the chassis to roll freely and still acquire your designated cross and settings.

CASTER/CAMBER

Each 2008 Element comes equipped with the RF caster set @ 10 deg. and the LF set @ 7 deg. These settings are obtained when both sides are lined up in the center position. During testing, we have found that these settings will work for most conditions and will be a good starting point, However caster is built into a racing chassis to help promote weight transfer, which is a major factor in producing the bite necessary to negotiate each corner on the track. The more caster will produce more weight transfer and more bite to the RR, and less caster will produce less bite and transfer. On tracks that are producing a lot of bite, less caster will be necessary since the race-track is producing all the bite and the tracks that doesn't produce bite more caster will be needed to create the bite/grip. Caster split is the difference between the RF and the LF caster. With the 2006 Inferno there is a 3 deg. split, increasing the split will tend to make the chassis want to turn left into the corner faster. This is okay for certain circumstances, but too much caster split will make the chassis push @ corner apex due to the insufficient weight transfer to the front tires. Decreasing the caster split to 1-2 deg. will make the driver put a lot of input, turning into the corner making the front-end feel tight and the rear-end twitchy.

A few good rules of thumb to use on caster, for those that are less experienced are as follows:

- 3 deg. of caster split is a safe amount and will work for most track conditions.
- Do not exceed 4 deg. of caster split and never run a 0 deg. of caster split.
- Use the RF as a baseline, and generally you will not need to exceed 15 deg. in the RF and no less than 6 deg.

Naturally these are simply guidelines and every driver and racetrack may require you to exceed these parameters. If you stay within these guidelines we are confident that your front-end settings will be a safe range to keep you up front.

CAMBER

Camber is another key ingredient in making your chassis work and transfer weight properly. Once all the preparations are done and the chassis is ready for front-end geometry settings and scaling, place a camber gauge on the RF/LF spindle bolt, level the gauge up and read the gauge +/- . Camber can be done with the driver in or out of the kart. There is not really a right way, just keep in mind to do it consistently. Once you have a baseline, it really isn't going to make a big difference.

RF camber can be related to how much the tire is being loaded by the transfer weight to the right. The RF will need to be negative camber to deflect the tire contact patch from the surface of the track. A track that doesn't have a lot of banking will require as much negative camber as a track with a lot of banking in the corners. We recommend running no more than -4.5 deg. and no less than -1.5 deg in the RF.

The LF can be considered as the tire that holds the kart in the corner. Comparing the two RF/LF, the RF accepts the load and the LF tire directs the load put in the chassis. The LF camber can also have a considerable amount of tire deflection. The more bite the track surface produces, the more deflection you create; therefore you need more + camber. If a track isn't producing a lot of bite, you may not need a lot of + camber. The banking of a track doesn't have a lot of input on your + camber in the LF although all of the front-end settings depends greatly on how the chassis loads and unloads during cornering. We recommend running no less than +.250 deg. and no more than + 1.750 deg of left front camber.

These parameters that we have given you will keep you in a safe zone, but they are only parameters, and may change due to certain track layouts and surfaces.

With every camber/caster movement, the toe-end may be affected so keep a close check on this measurement.

SQUARING THE CHASSIS

Squaring the chassis is a major part of your racing program a chassis that isn't square and in line will not roll well, and have a tendency to turn left real hard. As mentioned in the other settings, eliminating any chassis bind will keep a chassis working properly. We recommend using a SQUARE-N-TOE alignment tool manufactured by Dill Fabrication Co./ ULTRAMAX to insure the most accurate alignment possible. First, remove the RR/RF/LF hubs and all components on the axles, then place the S-N-T on the axle and the RF spindle arm. Keep the axle rolling freely inside the S-N-T and place the spindle arm into the S-N-T. Square the RF to the RR axle, setting your pitman arm @ a 5 deg. angle. Place the steering pin in the center position and lock it into place. Keep in mind the right side is square and cannot move, so place the S-N-T arm on the LF and measure across the chassis and

adjust the toe-end to your designated toe. The chassis will toe in 1/32 once the chassis is placed under load. We recommend 1/8" toe out when setting with the SQUARE-N-TOE Alignment System.

STEERING ACKERMAN

Your 2008 Ultramax Element implements fully adjustable Ackerman. Ackerman is the function of the front-end geometry and the rate of speed, the inside tire radius compared to the outside tire. This is based on the theory that the LF tire is traveling on a tighter radius than the RF tire. The 2008 Element comes equipped with multiple adjustments and from the factory will be in the center positions. With testing, we found that these settings will be the best suited for most track condition; however, these may vary due to track surfaces and conditions.

On the fast hard biting race tracks, moving the LF tie-rod forward may free the front-end from the apex to corner exit. There is a point with moving the LF forward that you drag the LF instead of the tire leading the kart into the corner, through the center and off you may encounter a push and it is simply because the LF is not loading because of the rate of speed it is turning compared to the RF. Likewise, on a low biting track, you may find that it would be helpful to move the LF backwards one hole and this will slow down the rate of turning speed, creating more bite to the LF and the chassis.

Moving the RF will affect the chassis just the opposite. So keep this in mind, if your chassis isn't exactly right, the Ackerman adjustments will not make a bad handling chassis a great chassis. This is for fine tuning only. Basically, if you are not comfortable adjusting the Ackerman, the factory settings will be pretty close for you.

BODY MOUNTING

We @ Ultramax, over the past several years, have strived hard to produce a body kit that fit our chassis and others very well. We also have a body that wouldn't have an AERO push when tucked in behind others and still have enough down force to make the chassis work properly. The 2008 body kit is very sleek in design and fits your 2008 Element without any bind.

Mounting the body kit will also be a very critical step in making your chassis perform. In this section we will break down the proper way to mount the body kit on your chassis, so you will get optimum performance out of your 2008 Element.

First, you need to connect the side panels to the nose of your Ultramax body kit. Starting with the right panel connected to the nose, which will mount flush and have an easy-fit, drill 3 holes with a 3/16" drill bit. The holes should be drilled 2" on the fender and 1" into the front/side air dam. Place either a 10-24-button head bolt/washer or a pop rivet to secure the right panel to the nose. Now you are ready to connect the left panel, so repeat the steps above. Place wheels and tires on the chassis to insure that when the body is mounted that all objects clear the body kit. Place the chassis on a level floor/surface, and slide the body kit on the chassis. We recommend using a 1" block on the nose/side panels to achieve proper ground

clearance. Now, place the wheels/tire in the center of the wheel wells and make sure the body is square and in line with the chassis. Keep in mind that WKA rule is that tires can't be inside the body more than 1" and also inside the side panels on the rear more than 1". After all this is checked, mark/drill the holes with a 3/16" drill bit.

After you slide the body kit back on the chassis, place the button head 10-24 bolt or a pop rivet and secure the body to the chassis. We recommend leaving the body loosely mounted to the chassis to prevent any chassis bind and rigid ness to the body.

SHOP AND RACE-TRACK SET-UP

In this section we will discuss set-up #'s, front/rear lead, ballast placement, tire pressure, and probably the most important thing in karting today... TIRES, TIRES and more TIRES.

Front/Rear Lead

Your 2008 Ultramax Element comes equipped with a front and rear lead adjustment. The front lead adjustment is on the RF and the total movement of the spindle assembly is ½". All chassis leave the factory in the front position and this setting will work for most track conditions and configurations. However, moving the RF into the rear position will make the chassis more responsive to the RF, causing the chassis to transfer quicker entering the corner and through the center. This can help on wide sweeping corners and also on some pavement surfaces, but the RF in the front position will be sufficient for most conditions. The caster plate welded to the chassis has 2 caster lines, if moved in the rear position, the proper line is the one closest to the driver. This is another adjustment that a driver can feel and it is his/her preference. I will mention that majority of our burris tire racers and pavement racers use the rear position Lead.

REAR LEAD

The 2008 Ultramax Element also comes equipped with rear lead adjustments. Likewise the RF adjustment, the Rear lead adjust the wheel base making it longer or shorter, this controls the speed of transfer and the tracking of the chassis. This adjustment is usually used for fine-tuning and not for making a bad handling chassis a great one. The rule of thumb with lead is making the right side wheelbase longer, loosens the chassis, shortens the left side, and also loosens the chassis. Moving these points will create rear-steer in the chassis. Moving the rear axle assembly in the other direction will have opposite affect on the chassis, making the right side shorter, the left side longer and will tighten the chassis somewhat. The 2008 Ultramax Element comes from the factory in the center position, and this will work for most tracks and surfaces. The 1/16" can help you on a tight bull ring race-track, and a lot of our Indoor guys move the rear lead adjustments to make the

chassis turn in the center on the corner and also to free up the chassis if necessary. We recommend squaring the chassis with the axle in the standard location, and then moving it once the toe-end and squaring is done. Again, this is a fine-tuning tool that we offer and, if you are not sure about moving the rear lead, the standard locations will work for most applications.

CROSS

Cross weight has been the main topic for many years now and this topic can be debated in many different aspects. In this section we will discuss what cross weight does and how it affects the chassis.

The 2008 Ultramax Element was built and designed to use a low-medium cross setting due to the strengthening of the rear hangers and also putting the axle inline with the main frame structure of the chassis. This design will provide the chassis to transfer the information equally and more positive than the previous chassis that we have built. The cross setting will determine the amount of load on the tires as the chassis transfers in the center of the corner and off. Cross has to work in conjunction with the left side percentage and also the nose. In testing, the Element seems to like 50-62% cross. This allows the chassis to sit more plane and without any bind. These are only parameters and these settings are the safe zone for you and may change for different track conditions and surfaces. On the higher biting race-tracks, we recommend using the higher cross setting with less left % and, on a low-biting track, the lower cross setting will be used with more left %.

Let's dig into the cross subject a little deeper. The more cross that is placed into a chassis produces more static load on the LR tire. This tire unloads entering the corner it loads the RF assembly and makes the chassis turn quickly, and then transfers the load back to the LR to create the forward bite off the corner. When this occurs, it relieves the RR tire from excessive temperature and stress causing the RR to last longer and create more grip as the race goes on. The lower cross setting provides more transfer to the RR and LF, causing all 4 tires to create heat and come in faster than the higher cross setting. Cross is a subject that if you ask 10 different people, you will get 10 different answers. Again the cross setting will have to work with other settings on the chassis, but staying within these guidelines we have discussed in this section, you will have a proper transferring chassis.

TIRES AND PRESSURES

Tires are the most important things within karting today. In this section, we will provide you with our views and opinions to complete your racing adventure with ULTRAMAX.

As, for the past 5-7 years, tires have become the main part of karting programs around the country. We feel like this is the most crucial thing that a racer could utilize time, effort, and money in this sport. Tire cutting has also come to the forefront and changed the way a chassis manufacture builds and designs a chassis,

and the cutting usually depends on who and why someone wins. On dirt tracks, all over the United States, the rubber thickness and profile/shape of the tire are very dependent on one another. The thinner the rubber and the radius on the corners reduces the spring rate and causes the tire to deflect more under load. A tire with a flat cut and more rubber on the corners will have more spring rate and not deflect the tire causing it to bite harder and produce more heat. We are not saying that you have to calculate all thickness and spring rates. We are simply trying to give you an understanding the theory behind tires and how they work. Also, keep in mind, new tires are usually the fastest tires due to the fresh rubber on the contact patch and fresh sidewall for pavement and dirt.

- The more speed and bite that a track has the less rubber will be necessary to run because of the heat transfer through the tire. Running a thinner rubber tire may require you to run a little more air pressure, to acquire the proper spring rate for that particular track and conditions.
- As a race-track loses bite and temperature of the tire decreases, then you will need more rubber to create a bond with the track and more rubber builds more heat. Less air will be required to get the tire to have the proper spring rate and deflection.
- The harder biting track requires a harder durometer tire and the less biting tracks require a tire that's a little softer.
- Tire chemicals is a major part of kart racing today, and there is a Chemical/Tire Guru @ every race-track. We recommend simplifying your tire program and chemical selection, so you can keep track of what you are using on each set of tires and be more consistent. All tracks like different chemicals, but most of the time it's not what you are using but how much is being used. We recommend choosing chemicals that aren't too harsh for the tires and treating tires not prepping them. Over the years, the chemical war has gotten out of hand, but we have found that working tires early in the week and letting them sit and air out, and then work them as you need to at the track will help you ruin less tires and not overwork them. These are a few chemicals that we use and like we said "TREAT TIRES NOT PREP THEM"
- Hotlap (I,II, KARTING 2000)
- PRO-BLEND Tire cleaner
- Track Claw
- Acrysol
- RED PREP (Trans. Fluid, Lacquer Thinner ect.)
- Goat/Yellow Prep (very harsh on tires, but good when wet)

Experiment with whatever product works good for you and your program. These are just a few of what our racers around the country use. Whatever you choose to run, remember make it simple and that it's not what you use it's how much that you use.

STAGGER

The 2008 Ultramax Element has a very big dependent on the amount of stagger that is in the front/rear of the chassis. These measurements are the

different circumference between the right and left side tires. These measurements will change the cross% every time they are moved. We recommend that running the lowest rear stagger possible, but keeping the kart turning through the center and staying free. On large tracks ¼ of a mile and above we recommend running the least amount of stagger as possible, due to the speeds of the tracks and the length of the straightaway. On tight bullrings we recommend running larger amount of stagger to keep the chassis turning well. These are the recommendations that we have tried in testing and should be in the safe zone for most conditions.

Front Stagger

The front stagger helps the chassis turn in and turn off the corner. Increasing the front stagger will also increase the cross and jack more weight to the LR. We recommend 1.125 –1.625 in the front stagger. These are only guidelines and may vary to different track, but will keep you in the safe zone by staying within these parameters.

REAR STAGGER

The Rear stagger helps the chassis turn getting in and through the center, keeping the chassis free. Rear stagger is probably more crucial getting through the center and off the corner. We recommend running .625-1.125 in the rear, and running the least as possible.

Another good preparation tool for staggering tires is to keep all the right side tires the same size and have left side @ a different circumference to change your stagger. This is key because of keeping the ride heights of the chassis the same with using different sets of tires.

BALLAST PLACEMENT

Ballast placement is another critical part of your chassis. Keep in mind to make sure all is secured to the chassis with no fear of flying off while in competition. Most racers have 5lb. pucks of lead that is used to obtain the proper weight for the class/division that you are running. A larger driver needs the ballast place lower on the chassis. Due to his VCG and transfer with a medium/smaller driver, we recommend placing the lead higher on the seat and/or the chassis weight tabs. Placing ballast evenly on the chassis is very critical. Seat location means a great deal to where the ballast will be placed. We recommend placing all weight inside the parameter of the 4 tires and not outside of them on bumpers, nerf bars etc. Another thing to remember is to never tie the chassis together at any point, this will prohibit the chassis from flexing properly.

SET-UP #'s and SCALING

The set-up #'s on the 2008 Element are somewhat different than the chassis that we have built over the past several years. This chassis is a totally different design and has been tested, Computer simulated for flexibility. This chassis will require a little different set-up #'s than the conventional chassis, being more balanced and very responsive to small changes. In this section we are going to breakdown the set-up's by class and we are very confident that you will perform on the 2008 Ultramax Element if you stay within these guidelines.

Class	Left%	Cross%	Nose%	Camber	RTW
JR-1	53.0%	54-62%	46-47%	-2.75r +.5 l	39.250
JR-2	54.0%	54-63%	46-47%	-2.75 +.5	39.250
JR-3	55.0%	55-64%	46-47%	-2.75 +.5	39.250
Lite	57.0%	55-66%	45-46%	-3.0 +.75	39.250
Med	57.5%	55-66%	45-46%	-3.0 +.75	39.250
Hvy.	57.5-58.5%	55-66%	44.5-46%	-3.1 +.75	39.250
Sup. Hvy.	58.0-59.5%	56-66%	44.5-45.5%	-3.2 +.75	39.250
Mod.	56.5-57.0%	57-65%	44.5-45.5%	-3.2 +.75	39.250
SR.Champ	56-57%	44-58%	44.5-45.0%	-3.5 +.5	39.750
Jr.Champ	55.5-56.5%	46-55%	44.5-45.5%	-3.3 +.75	39.750

These set-up #'s are only basic and depending on the track surface and conditions, these #'s may vary. We feel like you will be close in most circumstances and will be able to adjust from there.

THANK YOU

____Ultramax Racing Chassis would like to thank you on your purchase of the 2008 Ultramax Element. We can assure you that with using this tutorial as a baseline and staying between the guidelines discussed in this tutorial will make your Chassis a success. We @ Ultramax strive hard to build the safest, fastest, piece in the industry and with the Element we have accomplished this and we are proud that you chose us so we can share the success together. We will strive to support you and your racing endeavors 100%, and we are always looking for our customers feedback/comments so we can build you a better product and keep you running up front. Thanks Again, ULTRAMAX

