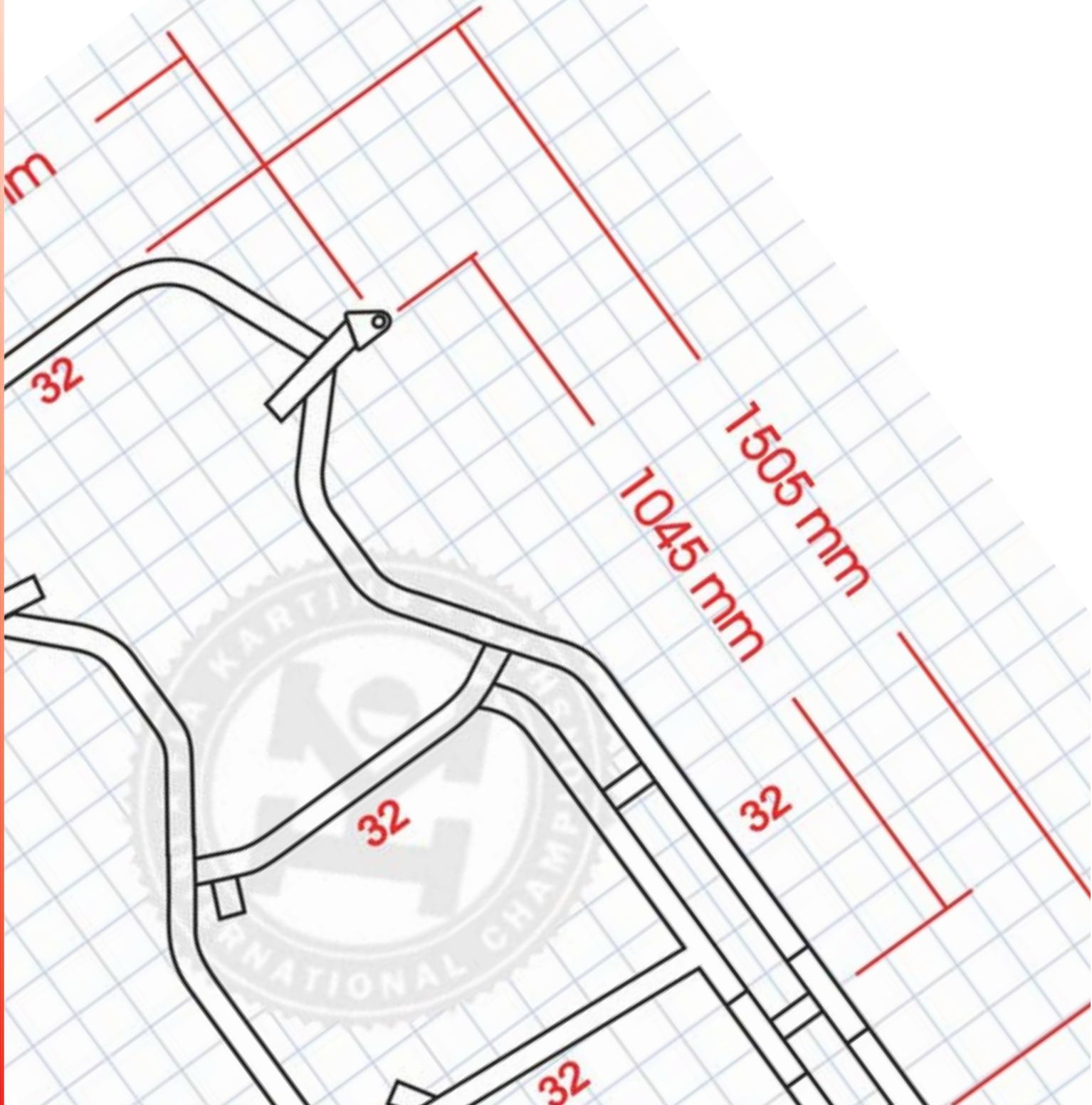


# ITALKART

## Chassis Setup Guide



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### PLEASE NOTE...

*Before making any adjustments, be sure to test your Italkart in its recommended standard setup. It is essential to make only one adjustment at a time. When you first go to a track that you have not been to, start with a baseline set-up and work from it. It is always hard to decide which change to make first when tuning your chassis. Try not to be over analytical or else you will end up chasing the set up. What we do, is start with minor changes (such as front or rear track width) if the change is positive, head in that direction. The problem with changing more than one thing at a time it becomes difficult to determine exactly what made the kart better or worse. Ultimately, you want to be able to change a setting, anticipate what it is going to do, and then feel that change on the track. Many drivers think that the kart's chassis setup can be established in a standard way for each individual track. Nothing could be further from the truth. They may represent a starting point, but many aspects cannot be identified until you actually start driving on the track. To start with you must take the condition of the track into consideration. A circuit may have a lot of rubber on it if a race has recently been held, or be very slippery if it has rained or if many rental karts with hard tires have driven on it. The weather may change, among other aspects that affect the kart. For this reason, you must be extremely well-disciplined in working on your kart to determine the best set-up. In fact, personal driving technique should also be taken into account, as two drivers may be equally fast but with the kart set up in different ways.*

*Let's start by defining the three main problems that stress the frame of a kart:*

**1. Understeering:** *the frame tends to turn excessively at the front, widening the trajectory of its front wheels and forcing the driver to steer more than necessary, and earlier than normal, to obtain the desired trajectory. Meaning, the driver is turning the kart but the kart wants to go straight through the turn. At times, understeering can be confused with oversteering: this happens when the front finally turns because of excessive turning, grips and then causes the rear to slide into a bend.*

**2. Oversteering:** *the frame tends to turn too well when set by the driver and, in extreme cases, to spin 180°. In this case, the driver is forced to counter-steer to keep the kart on track. As in the previous case, the driver may confuse oversteering with understeering. Simply, this is when the kart slides either from too little rear grip or far too much front grip.*

**3. Excessive grip:** *the effect of excessive grip is to make the frame jump up and down, thus making it difficult for the driver to drive.*

*Whenever these problems arise, as the kart approaches a bend, precious tenths of a second are lost, when multiplied by the number of bends in the circuit, a considerable increase in the lap time will occur, possibly several seconds. Understeering and oversteering may be diagnosed, not only by the driver's sensation, but also by a careful analysis of the tires. In fact, soft tires tend to tear on the tread when they slide and, compared to the axle which does not slide. This sliding will create an increase in pressure, which can be measured when the tires are hot as soon as the vehicle stops at the pits. If hard tires are used, they do not produce visible signs of slipping on the tread, the pressure of the hot tires, is the only indication. Tire pressures should be approximately 11.0 psi on a cold day (winter conditions) and 11.5 - 12.0 psi on a hot day (summer conditions). Under ideal conditions, the tire pressure should increase about 2.0 – 3.5 psi from cold to hot measurements. Be sure to evaluate weather conditions and the consequent increase or decrease of the track temperature. It is always advisable to make one change at a time, to check whether you are achieving the desired result or not. Remember, the driver will largely influence what the kart is doing. So be cautious when setting up the kart to suit a drivers bad habits. You are much*

*better off too correct the driver's mistakes and then focus on the set-up. There is absolutely no substitute for practice to get the driver as comfortable as possible. Simply put, the goal should be for driving to become as natural as walking.*

### **Axle Bearing Adjustment**

# Axle Bearing Adjustment

1. AXLE BEARING ADJUSTMENT
2. HEIGHT ADJUSTMENT OF THE REAR AXLE

**Problem:** Kart is unstable over bumps or has too much rear grip

**Chassis Adjustment:** Loosening the third bearing will not only improve the ride over the bumps, it can also assist in helping free the chassis up (similar to going to a softer axle just a much smaller change). For lower horse power classes, it can be an advantage to run without it but always test it first.



**Problem A:** Kart is lifting both inside wheels excessively  
**Problem B:** Rear of kart slides / oversteer on entry

**Chassis Adjustment A:** Raise axle in the chassis. This will lower the ride height reducing rear grip.

**Chassis Adjustment B:** Lower axle in the chassis. This will raise the ride height increasing rear grip.

The above adjustments assume the axle is in the center or neutral position to when the initial handling problem described occurs.



#### **Why?**

All Italkart's have rear axle height adjustment, by raising the height of the rear axle in the chassis you are lowering the rear ride height. In effect, this changes the "centre of gravity", (c/g), of your kart, which is lowered and moved back compared to the axle in its normal full down position in the chassis. To put it simply, lowering the chassis will reduce grip while raising will increase grip.

**Note:** *As the general rule, the axle should always be left in the middle position as the kart's normal setting. Only when track conditions start making the kart two-wheel excessively through corners should the axle be raised*

### Height Adjustable Front Stub Axles

# Front Stub Axles

<b>Problem A:</b> Too much steering or excessive front end bite on turn-in	
<b>Problem B:</b> Rear of kart slides / oversteer on entry	
<b>Chassis Adjustment A:</b> Lower the front ride height by raising the front spindle/stub axle by one spacer at a time.	
<b>Chassis Adjustment B:</b> Raise the front ride height by lowering the front spindle/stub axle by one spacer at a time.	
<small>The above adjustments assume the axle is in the center or neutral position to when the initial handling problem described occurs.</small>	

#### Why?

Height adjustable front stub axles are an aid to achieving that “perfect” kart set-up. What is being achieved when the front stub axles are lowered or raised is raising and moving back or lowering and moving forward the kart’s “centre of gravity”(c/g).

When you lower the stubs in the frame you raise the kart’s front ride height. This raises the karts c/g. as well as moving it further back. One effect on the kart is that it will be a little slower with its first-off reaction on initial steering wheel input but from then on in the front will have more grip all the way to the apex. Another effect of having moved the c/g. back is that it will create more back end grip throughout the entire corner as well as making the rear of the kart sit flatter. When doing this you need to be careful as you might start feeling your engine is going off, causing you to loose drive out of the corner, but the kart feels great. What is actually happening is that the kart is sitting too flat through the corner. The result of this is that it is not allowing the “differential effect”, which lifts the inside (unloaded) back wheel off the track through the apex. Instead you are pulling the engine down because it is trying to drive both back tires through different arcs on a fixed back axle.

**Note:** By raising the stub axle in the chassis you lower the kart’s front ride height achieving the reverse of the above.

### Brake Adjustment

# Brake Adjustment

#### 1. PAD WEAR ADJUSTMENT

<p><b>Problem:</b> "The engine has no top end speed"</p>
<p><b>Solution:</b> Verify the brakes are not dragging. Keep in mind that most Italkart brakes (any with little bottle above master cylinder) are a reservoir based system. Meaning, it is normal for the brake fluid level to get lower and lower as the life of the brake pads decrease. If it is getting low, do not top it up unless you are sure the brake pads still have a significant amount of life left. If you add fluid when the brakes have very little material left on the pad, when you go to replace the old ones with new ones you will have to push the pistons back in to the caliper forcing the fluid back in to the master cylinder and the fluid will have no where to go. This will cause the brakes to drag. So please ensure that when new pads are installed, the fluid level in the reservoir bottle does not exceed the maximum level.</p>
<p><b>Problem:</b> "Excessive pad clearance between each pad and the disc" (Pad adjustment is necessary when the clearance between each pad and the disc exceeds 3mm) This will only be on certain ELITE and CADET model chassis.</p>
<p><b>Solution:</b> Reduce the gap between the rear brake pads and the disc by fitting a shim between the caliper piston and brake pad. You must do this on both sides to ensure pad clearance to the disc is equal. Remove the pad safety pins and fit a shim between the caliper piston and the brake pad. Refit the safety pins. You can fit additional shims as the pads wear more, however, ensure you do not fit too many shims as this could cause the pad return springs to spring bind and this will seriously affect your brake performance. Should you encounter difficulty fitting the shims then remove the four pad return bolt/springs, fit the shim and refit the return bolt/springs.</p>

#### 2. PEDAL PRESSURE ADJUSTMENT

<p><b>Problem:</b> Brakes are too sensitive or soft for my liking</p>
<p><b>Adjustment :</b> Braking pressure can be adjusted with changes on both the pedal side as well as the master cylinder side. There are typically 3 attachment holes on the pedal and 2 on the master cylinder. The lower the mounting point on the pedal the more sensitive the braking will be. The opposite is true for the master cylinder lever, the higher the mounting point on the master cylinder lever the more sensitive the brakes will be.</p>


### Crash Bar Adjustment

# Crash Bar Adjustment

**Problem:** Understeer from the apex to the exit of the corner

**Side Pod Bar Adjustment :** Loosening or removing the front bolt of the side pod mounting bar will usually reduce grip and help with reducing understeer.



**Rear Crash Bar Adjustment:** The lower rear bar reacts similar to the rear torsion bar, however it has a much smaller affect. Tightening will increase rear grip while loosening it will help free the kart up. Since the Supersonic V uses a bearing mounted bumper, this change has no affect on this model and the bar should always be left loose.



**Upper Front Bumper Bar Adjustment :** The bolts for the upper front bumper should be attached with a rubber spacer and be firmly tightened but no too tight. Loosening these bolt will reduce front steering/grip.



CRASH BAR ADJUSTMENT

### Front End Alignment

# Front End Alignment

## 1. ADJUSTABLE ACKERMAN

<b>Problem A:</b> Engine lacks mid-range power when applying power coming off the corner. <b>Problem B:</b> The back of the kart slides or there is too much bite or oversteer on turn-in.	
<b>Chassis Adjustment A:</b> Increase the amount of ackerman by moving the tie rod end to the inner holes on the spindle arm. <b>Chassis Adjustment B:</b> Reduce the amount of ackerman by moving the tie rod end to the outer holes on the spindle arm.	

### Why?

#### A) Adjustable Ackerman on the Stub Axles' Steering Arms

Italkart's are supplied with stub axle steering arms that offer two settings as to where the steering links can be bolted. These bolt holes set the amount of Ackerman utilized by the kart.

Firstly, let's explain how Ackerman works. If you take a piece of string 30cm long, and fix one end to a table, at the free end make a mark at the tip then a second mark 5cm. further in, 25cm from where the string is fixed. The first mark you made represents the outside front tire of your kart, the second mark being the inside front tire and the fixed end on the string being the fulcrum of the arc the kart is going through in a corner. Keeping it tight, when you move the string straight off you'll notice that the inside front tire is going through a smaller diameter arc than the outside tire. All things being equal, the inside front tire needs to be turned more into the corner than the outside front, the principle used to achieve this in a car or, in our case, kart is called Ackerman. The outside holes give almost parallel steering meaning front wheels turn at almost the same rate one to the other. In using the inner hole offered on each stub axle, the kart will have more Ackerman or, in other words, the more the inner stub axle will turn in ratio to the outer stub, (or, if you like, the more the toe-out increases as the steering wheel is turned.)

# Front End Alignment

On the track increasing Ackerman has the effect of increasing 'turn-in' of your kart. It forces the inside front tires to work more as well as increasing the mechanical chassis jack effect, or in other words will increase the amount of lift off the track you'll get with the inside back tire through a corner while at the same time increasing the mechanical grip of the outside back tire. This is all good stuff but like all good things in life too much can be bad!

On a track which offers a lot a fast sweeping corners with a fast corner leading onto the longest straight, running a lot of Ackerman will only help kill your top end speed (though you will only know this through testing). It's like setting the kart with toe-out where the front tires become dragging front brakes. On a track with lots of 'stop, turn, go' 180° type corners, lots of Ackerman will really help. The kart will change direction quickly without overworking the outside front tire while the engine will be helped on acceleration out of the corner with the added chassis jacking offering a greater differential effect (see "Height Adjustable Front Stub Axles"). For rookie or young drivers, reducing the Ackerman (outer holes) slows the steering down if they turn too quickly and cause the kart to slide.

### **B) Adjustable Ackerman on the Steering Column**

All Italkart's offer adjustable Ackerman on the steering column where the steering links are bolted to the steering column 'spade'. When supplied from the factory, the steering links will be bolted on at the outer two holes of the spade. Bolting both steering links to the same central hole as offered on the spade will decrease the amount of Ackerman the kart will have, (see above for explanation of how Ackerman principle works).



**FRONT END ALIGNMENT**

# Camber and Caster

## 2. ADJUSTABLE CAMBER AND CASTER

<b>Problem A:</b> The kart understeers all the way through the turn.	
<b>Problem B:</b> The back of the kart slides or there is too much bite, or oversteer, on turn-in.	
<b>Chassis Adjustment A:</b> If the adjustable Camber/Caster pills are installed increase the amount of caster.	
<b>Chassis Adjustment B:</b> If the adjustable Camber/Caster pills are installed reduce the amount of caster.	

### Why?

Italkart's are all supplied with camber/caster adjusting concentric king pin-locating washers as standard.. By increasing caster you'll increase turn-in grip. Running full caster in the wet is a must. In the dry increasing caster is okay when looking for better turn-in. It should be noted that too much caster would create a very nervous kart on entry to corners.

On an Italkart there are three possible caster settings while retaining the kart's standard camber setting:

- **Minimum Caster** – 4 dots facing to the back of the kart;
- **Maximum Caster** – 4 dots facing to the front of the kart;
- **Central or Neutral Caster** – 4 dots facing the gas tank

By moving the indicator dots towards the centre of the kart you will introduce increased positive camber on the attached relevant front wheel, conversely by moving them away from the centre of the kart you will increase negative camber.

**Using alignment bars, the camber setting we recommend should be:**

'SL' tires: 1mm (meaning both front tires should be the same top to bottom).

'Open' CIK Homologated tires: 0-8mm negative (meaning both front tires should be straight up and down or up to a maximum of 8mm wider apart at their bottoms than their tops).

### Track Width

# Front Track

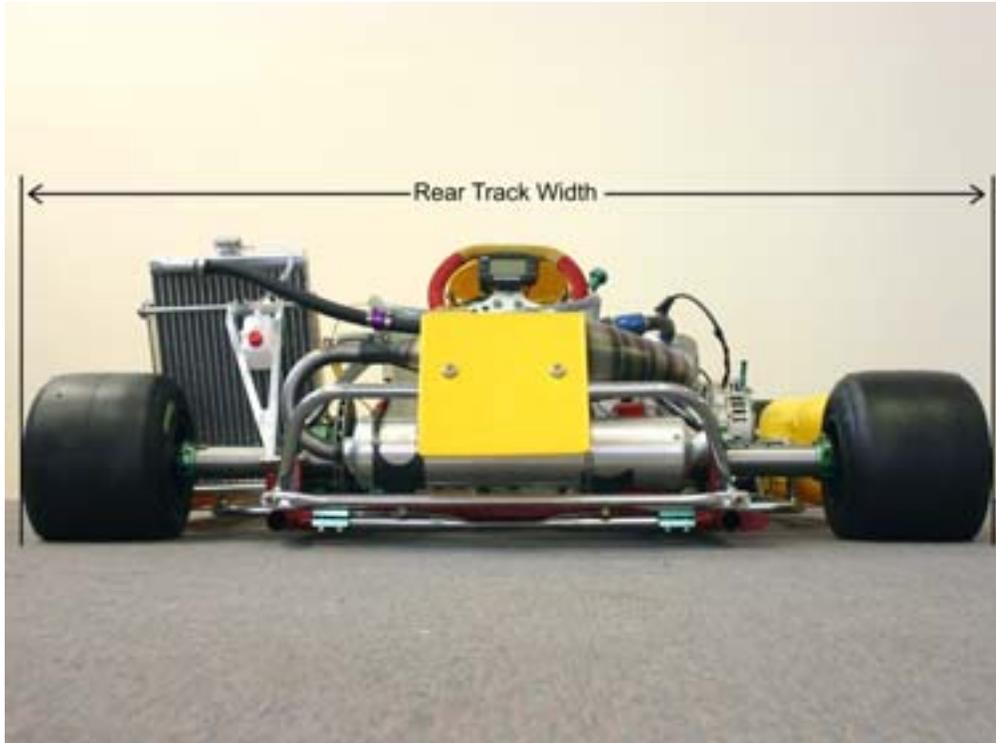
<b>Problem:</b> "Understeer on turn-in to the apex of the corner"
<b>Solution:</b> Widen the front track by a 5mm spacer at a time.
<b>Problem:</b> "Oversteer or very sensitive front steering causing the rear to slide."
<b>Solution:</b> Narrow the front track width by a 5mm at a time.
<b>Problem:</b> "There is not traction/the kart is oversteering coming from the apex out"
<b>Solution:</b> reduce rear track width by 5mm on each side.
<b>Problem:</b> "The back slides/the kart oversteers going into the turn"
<b>Solution:</b> Increase the rear track width by 5mm on each side. Do not exceed the maximum regulation
<b>Problem:</b> "The kart understeers all the way through the turn"
<b>Solution:</b> Increase the rear track width by 5mm on each side. Do not exceed the maximum regulation.
<b>Problem:</b> "There is bounce in the rear"
<b>Solution:</b> Increase the rear track width by 5mm on each side. Do not exceed the maximum regulation.
<b>Problem:</b> "The track is very bumpy giving the kart a lot of bounce"
<b>Solution:</b> Increase the rear track width by 5mm on each side. Do not exceed the maximum regulation.
<b>Problem:</b> "The kart is lifting up on two wheel in the corners"
<b>Solution:</b> Increase the rear track width by 5mm on each side. Do not exceed the maximum regulation.

# Rear Track

### Why?

Narrowing the rear track will make the rear bite into the track and sometimes provide more rear grip. However, avoid continually narrowing the rear track to obtain more grip as you will find that only so much grip can be obtained and you will then be upsetting the balance of the kart making it much more unstable and difficult to drive.

# Rear Track



***Important: Rear track is probably the most important single variable in a kart chassis. Different driving styles and different tracks will require different settings. The standard setting is the best starting point and we suggest you vary the rear track by no more than 5mm each side per change.***

It is a weird karting phenomenon, but nevertheless a fact that in certain conditions a wider rear track will provide more grip and in contrast, different conditions may see a narrower rear track provide more grip. We believe rear track is more an aid in balancing the kart and suggest you be prepared to experiment to search for your own best setting. In some cases we have even found significantly narrowing the rear can reduce understeer

### REAR TRACK

### Front Wheel Alignment

# Front Wheel Alignment

It is important to remember that all karts need to have a wheel alignment done prior to each new day on the track.

The first stage to doing a front wheel alignment is making sure you've set the height of your kart's steering wheel to where you find it will be most comfortable. On Italkart's, the upper plastic bushing on the steering shaft is height adjustable by the two holes at the top of the chassis steering shaft support uprights. It can also be adjusted by rotating the plastic bushing upside-down.

Once you've done that, make sure the steering spade at the bottom of the steering shaft, (where the two steering tie rods are bolted on) and are horizontal. Using a set of alignment bars, toe-in/toe-out should be 2mm toe out as a starting point. We strongly recommend using Sniper laser alignment tools to achieve the best results.

# Seat Stays

<b>Problem :</b> The kart has no traction or oversteers from the apex to the exit of the corner.	
<b>Chassis Adjustment :</b> Mount seat struts to each side of the seat. in some cases 2 seats stuts may be required.	

**Note:** Additional seat stays are available which fix to the axle bearing flanges and the top section of the seat. Testing has shown these to be advantageous under certain conditions and a disadvantage under others.

### Adjustable/Removable Torsion Bars

# Adjustable Torsion Bars

**Problem A:** There is no traction/the kart is oversteering coming from the apex out of the corner.  
**Problem B:** There is understeer all the way through the corner.

**Chassis Adjustment A:**

1. Running the torsion bar full stiff (flat surface is vertical) will maximize rear grip and reduce rear chassis roll.
2. When the kart has a rear torsion bar or tensioning bolts on the fourth rail, tighten the tension bolts completely.



**Chassis Adjustment B:**

1. Running the torsion bar full soft (flat surface is horizontal as shown in the photo) will reduce rear grip and increase rear chassis roll. If the rear bar is already full soft it can be removed completely.
2. If the chassis has a fourth rail remove the tensioning bolts. If the tensioning bolt have been removed already then the bar itself can be removed.



#### ADJUSTABLE/REMOVABLE TORSION BARS

# Adjustable Torsion Bars

#### Why?

##### 1. Removable Front Torsion Bar

Removable front torsion bar is a set-up affecting mechanical grip on the front tires. Removing the front torsion bar in your kart will decrease front-end mechanical grip.

##### 2. Adjustable/Removable Side Torsion Bar (chassis fourth rail)

The tension bolts on the fourth rail on some karts are designed to allow adjustment to the stiffness of the centre section of these chassis structures. Under normal track conditions this bolt should be left in and done up tight. As a track offers more grip or as rubber goes down on the driving line, then the bolt should be loosened until the point you can turn it freely with your fingers. If the track has good grip with a lot of rubber on the driving line or if the track is very bumpy then the bolt and its spacer should be removed from the kart.

Having the side bar fitted in your Kart will normally provide more grip. Conversely, removing this bar will reduce grip.

### 3. Adjustable/Removable Rear Torsion Bar

The adjustable/removable rear torsion bar is a good tool in helping to create more grip in the back of your kart. Most Italkart models are supplied with this chassis-tuning feature. This allows you to fine tune the chassis by increasing or decreasing rear end grip. Running the bar “full stiff” (i.e. with the blade of the torsion bar set vertically to the track’s surface,) will maximize rear mechanical grip as well as reducing rear chassis roll. Turning the bar towards the horizontal position will reduce rear mechanical grip while increasing rear chassis roll. Removing the rear torsion bar completely is the “free-est” setting.

When using the kart on a dry but slippery track, running with the torsion bar fitted and the blade set horizontally will give the kart more traction off the turn. On a track with a good visible rubber line we recommend that the torsion bar assembly be run “full-soft” or even removed from your kart. On tracks that are very bumpy in braking areas and turns, removing the rear bar will allow the chassis to ride over the bumps smoothly thereby allowing the tires a better chance of maintaining contact with the surface.

### Tire Pressures

## Tire Pressures

<b>Problem:</b> “The engine has no top end”
<b>Solution:</b> Raise the rear tire pressure by 1 P.S.I.
<b>Problem:</b> “The back slides / the kart oversteers going into the turns”
<b>Solution:</b> Raise the rear tire pressure by 1 P.S.I.
<b>Problem:</b> “There is too much steering or front end bite on turn-in”
<b>Solution:</b> Lower the front tire pressure by 1 P.S.I.
<b>Problem:</b> “There is understeer all the way through the turn”
<b>Solution:</b> Raise the front tire pressure by 1 P.S.I.
<b>Problem:</b> “Understeer on turn-in to the apex of the corner”
<b>Solution:</b> Raise the front tire pressure by 1 P.S.I.
<b>Problem:</b> “Understeer from the apex to the exit of the corner”
<b>Solution:</b> Lower rear tire pressure by 1 P.S.I.

#### TYRE PRESSURES/PREPARATION

### Seat – Fit and Position

# Seat – Fit & Position

<b>Problem:</b> “There’s no traction / the kart is oversteering coming from the apex out of the Corner”
<b>Solution:</b> <ol style="list-style-type: none"><li>1. Move the whole seat a little more upright and back by 12mm.</li><li>2. Replace the seat with a seat that is stiffer diagonally across the seat.</li></ol>
<b>Problem:</b> “Understeers from the apex to the exit of the corner
<b>Solution:</b> <ol style="list-style-type: none"><li>1. Move the seat 12mm further forward .</li><li>2. Replace the seat with one that is softer diagonally across the seat.</li></ol>

#### **How to fit a seat correctly...**

Picking a seat that fits you correctly and fitting it into your kart are two very important operations that will affect the performance of the kart. Firstly!, make sure the seat fits you well. We recommend the Kalit (for ‘SL’ type tires) or Tillet Euro (for high grip ‘SL’ or ‘Open’ type tire) seats. Place the chosen seat on the floor and sit in it with your legs out flat and arms held out as if you were in your kart and driving it. You should fit all the way down into the seat. The seat should firmly hold your hips, while you must be able to place your flat hand in between the seat and your rib cage without using force.

When fitting a seat in your kart, it is essential that the frame is not stressed or forced in order to tighten up the seat fixing bolts. Italkart offers a range of seat spacers that help making the job of fitting a seat easy. Make sure you use a large diameter seat washer against each side of the seat; a very important must in spreading cornering loads. We recommend having the bottom of the seat solidly mounted with either aluminum or hardened plastic spacers only.

### Weight on the Kart

# Weight on the Kart

Lead ballast should be securely fastened to the sides, rear or underneath of the seat. The best place for the majority of your lead ballast is underneath the seat at the front (Crotch area) or the drivers left hip to help balance out the engine weight. Do not add ballast to any other part of the kart chassis. A driver with a light body weight may achieve better handling by fastening ballast as high as possible on the seat. Adding a significant amount of ballast can have a marked affect on the handling of the kart. It may be necessary to test different mounting positions for the ballast.



### **Wet-Weather**

#### **WET TIRES:**

- **Front Track:** Move front wheels out as far as possible.
- **Rear Track:** try to line up rear tires with front. In some cases, it is beneficial to invert rear wheels on 50mm axle to get the rear width even narrower. This is beneficial on very wet tracks but you will want to mount normally on a drying track.
- **Caster Adjustment:** If time permits, adjusting to maximum caster (4 dots facing front of kart) will reduce understeer.
- **Tire Pressure**

Extreme	wet	conditions:	25-30psi
Moderate	wet	conditions:	20-25psi
Drying		conditions:	15-20psi

#### **WEIGHT THE KART/WET WEATHER**

### **Fitting Tires**

## FittingTires

Fitting tires will depend upon the class the kart is being assembled for. When inflating the tire to seat the bead, do not over inflate. There is a very real risk of serious injury if the manufacturer's advice printed on the sidewall of all tires is not followed. To aid the seating of the bead a light coating of soap applied before inflation and using external steel tire rings around the tire will help. Do ensure all tires are wiped after this process and check for any damage or defects before placing the tire on the kart.

### Rear Wheel Hubs

# Rear Wheel Hubs & Axles

<b>Problem:</b> "Understeer from the apex to the exit of the corner"
<b>Solution:</b> Replace rear hubs with shorter ones.
<b>Problem:</b> "There is no traction / the kart is oversteering coming from the apex to the exit of the corner"
<b>Solution:</b> Replace rear hubs with longer ones.



#### Why?

By increasing or decreasing the distance between the outside of the rear axle outer bearings and the inside face of the rear wheel hub you are in effect increasing or decreasing the amount of "working" axle. The "working" axle is considered to be the length of axle between the kart's main chassis rails and the wheel assembly that is left clear to flex un-hindered. In the same way as altering the rear track width, reducing the amount of "working" axle will make the rear bite into the track and sometimes provide more rear grip. Instead of going to narrow and/or wide with the rear track, the ability to change to longer or shorter hubs is a major advantage in trying to obtain the ultimate kart balance. Different length wheel hubs are available and these can be utilized to further fine-tune your kart's handling to your individual liking

#### AXLE DIFFERENCES

**Italkart SA** = The softest - This axle is used to free up the rear or to take understeer (push) out of the kart. This axle is only used for non shifter classes.

**Italkart S** = The second softest axle - This axle has a similar to the SA. It is slightly harder and it can be used in the shifter category too. It is advantageous to use this axle on bumpy tracks. The S axle also helps forward traction in shifter but it will not load the tire as hard through the corner. The S axle will also free the kart up on a grippy track.

**Italkart M** = The medium grade axle. This comes standard in all 125cc and 100cc chassis. This is a versatile axle, which offers good rear and front grip. It is a great starting point for any track that you may go to.

**Italkart H** = This axle is the stiffest Italkart manufactures. It is used to improve rear grip and it loads the rear tire much quicker. If inserting the rear torsion bar is a big gain in rear grip, you can look at going to a stiff axle. We do not recommend using a stiff axle in a junior kart. If the track is extremely bumpy, the stiffness of this axle may hurt the karts handling over the bumps.

Because of the different track surfaces requiring different combinations of these factors you will always get into trouble with a simple more grip less grip theory. Therefore make sure that when you do test and discover for example the soft axle is working best, look at the track, wet dry, cold or hot, close grained or rocky tarmac surface. You will then get a feel for that particular axle, on that track, in those conditions.

### **Adjustable Brake Balance Bar** (as fitted on some 125cc gearbox karts)

# Adjustable Brake Balance

**Problem:** “Too much front end bite on turn-in”

**Solution:** When front brakes are installed adjust the bias for more rear brakes.

The brake balance bar fitted on 125cc gearbox karts allows you to regulate the percentage of braking done between the front and rear wheels. The balance bar distributes the brake pedal movement transmitted to the front brakes and the rear brake's master cylinder pumps. The best way of adjusting the brake bias is to do it when the kart is on the kart stand. Adjust the brake balance bar into a position where, with pressure applied on the brake pedal, both front and rear wheels can just be turned by hand.

## **Brake Maintenance**

### **1. Always check the feel of the brake pedal making sure it feels hard without any sponginess.**

If the pedal does feel a little spongy, bleed the system only using racing Dot-4 grade hydraulic brake fluid, (we recommend Shell.) Do not use Silicon brake fluid. Before attempting to bleed the brake, retract the dust boot on master cylinder to check if piston is against the circlip (adjust the pushrod if necessary.) To bleed the brake, depress master cylinder lever. Whilst keeping pressure on the lever, open the bleed screw in the brake caliper. Keep pressure on the master cylinder lever until the bleed screw is tightened. Release the lever. Repeat this process while maintaining the reservoir fluid level, until the new fluid has been flushed through the system. Repeat for other side of the caliper. If, having done this, the brake pedal still feels spongy, check for leaks. As a safety check, make sure the pad retaining bolts are tight. We do check them at the factory but double-checking never hurt anyone.

**Note:** After a period of 3 months it is recommended you replace the brake fluid by rebleeding. Whilst bleeding the brake, ensure the fluid level does not drop. Ensure pad adjustment is kept within tolerance given. Lack of adjustment will result in caliper piston and bore wear becoming excessive, and leakage occurring.

- 1. Ensure the master cylinder lever always has very little free play. If the brake rod is adjusted in such a way that no free play exists and the master cylinder lever has pressure on it, adjust either your pedal stop or brake rod length.**
- 2. Your brake system should be overhauled every 6 months. The system should be stripped, washed in water or methylated spirits, new seals fitted and re-bled. Your kart dealer can overhaul your brakes if you are unable. “Don't wait for a failure – preventative maintenance is much wiser.”**
- 3. When your kart is new or whenever you fit new brake pads ensure you follow this “bedding in” procedure. Correct bedding-in improves pad life and braking performance.**

**Session 1:** For approximately 10 laps lightly apply brakes only, gradually increasing pressure used to approximately 40% of full braking.

**Session 2:** Do 2 laps at approximately 75% full braking and then for the next 2 laps work the brake hard. Do two cool down laps and they should be good to go.

### General Use and Safety Guide

# Use & Safety Guide

#### **PLEASE READ CAREFULLY**

#### **Congratulations on choosing a Italkart Racing Chassis**

In producing your kart, we have used only the best and highest quality materials and components, and all possible care has been taken. However you must be aware that this is a high performance racing / competition vehicle designed for use only on closed racing circuits. As such it is subject to very high levels of stress and strain, therefore it requires constant inspection, maintenance and replacement of components. FAILURE to carry out the above may result in severe injury, up to and including death.

It is your responsibility as the Owner/Operator/Driver to carry out this regular inspection and a maintenance schedule is offered to you for your guidance. Please be aware that in providing these guidelines we make no indication that these items are the only maintenance or inspection required, merely that they are important elements in the maintenance of your kart/s.

To carry out these inspections, a basic level of mechanical knowledge is required. If you are unsure or do not possess the basic level of mechanical knowledge required, then you must have this work carried out by a suitably qualified person. Contact your local Kart Distributor/Dealer for further information.

As this is a racing vehicle it is possible a collision may occur. If a collision occurs which results in damage to any of the following assemblies or any of their components, then the damaged component/s must be replaced and not repaired

- Steering Assembly including Stub Axles, King Pins, King Pin bearings and Tie Rods
- Brake Assembly including pedal and cables
- Side Pods including Side Pod Bars

All items should be constantly inspected for possibilities such as cracks from fatigue or crash contact, bending, seizing up, lubrication, normal wear and tear. Ensure all fasteners are tight and securely fastened. Items showing damage or wear must be replaced.

#### **MODIFICATION**

Please note that under no circumstances does Italkart authorize or recommend modifications of any type whatsoever to Go Karts or components we produce. This includes any alternative methods of assembly of any components. Any such alteration or modification performed is totally and solely the responsibility of the person/persons carrying out the same.

#### **PROTECTIVE CLOTHING**

For your protection and safety when driving a Kart you must always wear the following:

- Approved Safety Helmet
- Driving Suit
- Driving Gloves
- Driving Boots
- Ear Plugs
- Also a neck brace is highly recommended

**NEVER** wear loose fitting clothes or scarves. If you have long hair, it must be contained in a hair net to prevent being entangled in any moving parts.

#### **WARRANTY/GUARANTEE**

Racing is dangerous. The user/buyer shall be solely responsible for any/all property and/or physical damage resulting from the use of our products. This is a racing/competition vehicle no Warranty or Guarantee, either written or implied, exists.

***Gear Ratio Chart*****Gear Ratio Chart**

	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
<b>64</b>	7.11	6.40	5.81	5.33	4.92	4.57
<b>65</b>	7.22	6.50	5.90	5.41	5.00	4.64
<b>66</b>	7.33	6.60	6.00	5.55	5.07	4.71
<b>67</b>	7.44	6.70	6.09	5.58	5.15	4.78
<b>68</b>	7.55	6.80	6.18	5.66	5.23	4.85
<b>69</b>	7.66	6.90	6.27	5.75	5.30	4.92
<b>70</b>	7.77	7.00	6.36	5.83	5.38	5.00
<b>71</b>	7.88	7.10	6.45	5.91	5.46	5.07
<b>72</b>	8.00	7.20	6.54	6.00	5.54	5.14
<b>73</b>	8.11	7.30	6.63	6.08	5.62	5.21
<b>74</b>	8.22	7.40	6.73	6.16	5.69	5.28
<b>75</b>	8.33	7.50	6.82	6.25	5.77	5.35
<b>76</b>	8.44	7.60	6.91	6.33	5.85	5.42
<b>77</b>	8.55	7.70	7.00	6.42	5.92	5.50
<b>78</b>	8.66	7.80	7.09	6.50	6.00	5.57
<b>79</b>	8.77	7.90	7.18	6.58	6.08	5.64
<b>80</b>	8.88	8.00	7.27	6.66	6.15	5.71
<b>81</b>	9.00	8.10	7.36	6.75	6.23	5.78
<b>82</b>	9.11	8.20	7.45	6.83	6.31	5.85
<b>83</b>	9.22	8.30	7.54	6.92	6.38	5.92
<b>84</b>	9.33	8.40	7.64	7.00	6.46	6.00
<b>85</b>	9.44	8.50	7.73	7.08	6.54	6.07
<b>86</b>	9.55	8.60	7.82	7.17	6.62	6.14
<b>87</b>	9.66	8.70	7.91	7.25	6.69	6.21
<b>88</b>	9.77	8.80	8.00	7.33	6.77	6.28
<b>89</b>	9.88	8.90	8.09	7.42	6.85	6.35
<b>90</b>	10.00	9.00	8.18	7.5	6.92	6.42
<b>91</b>	10.11	9.10	8.28	7.58	7.00	6.50
<b>92</b>	10.22	9.20	8.36	7.66	7.07	6.57
<b>93</b>	10.33	9.30	8.50	7.55	7.15	6.64

GEAR RATIO CHART

# **ITALKART**

*Chassis Setup Guide*

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