



KNOWLEDGE PACKET

By:



8233 Oliver Road – Erie, PA 16509

P – 814.864.1846

F – 814.866.2697

E – Info@J3Competition.com

W – J3Competition.com



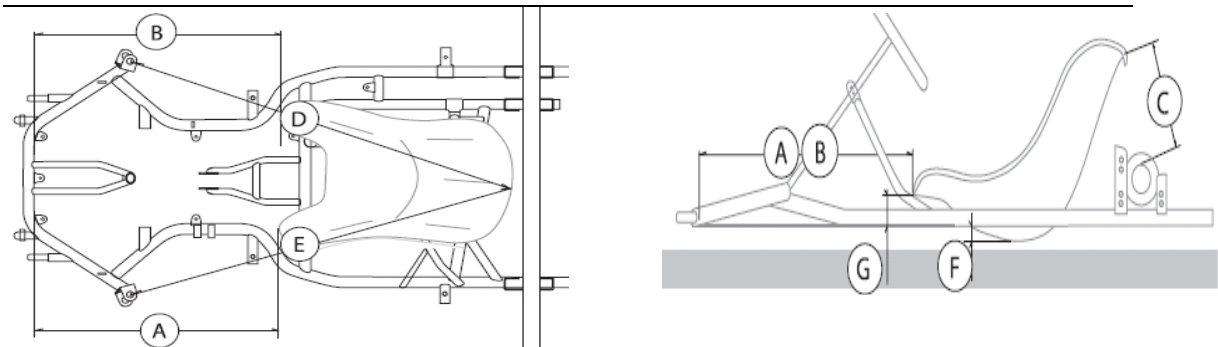
Index

1. Seat Installation
2. Front-Track Adjustments
3. Rear-Track Adjustments
4. Caster/Camber Adjustments
5. Front-Ride Height Adjustments
6. Ackerman and Steering Adjustment
7. Rear-Ride Height Adjustments
8. Tire Pressure
9. Axle Chart/Stiffness
10. Tuning Bars
11. Rear Hubs
12. Braking System
13. Basic Wet Weather
14. Conclusion



1. Seat Installation General (100 and 125cc) (Note for Tested Dimensions download Seat Setup PDF)

- A (mm) Dimension.....610mm
- B (mm) Dimension.....605mm
- C (mm) Dimension.....220mm
- G (mm) Dimension.....10cm



-If the driver is taller, measurements A and B can be increased by up to 10mm each, while reducing dimension C by 5mm.

-If the track is very ‘Green’ lacking rubber all dimensions can be changed as well. Often time dimensions A and B can be increased by 20-25mm in order to increase the effective weight percentage on the rear of the chassis, thus increasing the chassis grip. This will increase the chassis effectiveness when the driver is applying the power. In low grip conditions the seat can also be raised higher by increasing dimension G from 10cm to 11-11.5 cm. This change will effectively increase the chassis ‘Side Bite’ allowing the chassis to work the tires more.

Part Number	Product Description
0037.FP(1-2-3-4)	FLAT BOTTOM SEAT - FIBERGLASS
0037.00	STANDARD SEAT - FIBERGLASS

1A. Ballast (Weight Mounting)

J3 recommends using OTK weights, either 1 Kg (2.2 lbs) or 3 Kg (6.6 lbs). Part Numbers for both items are: (PN 0275.03) and (PN 0275.01) When fastening the weights to the seat use both provided holes on the weights with the proper hardware purchased through J3 Competition. Check with the organization(s) you are competing with to insure all rules are met. For general balance of the chassis depending upon how much if any weight you need to mount, it should be placed opposite of the engine and below the seat on the front edge that contours the driver’s legs. This will provide for a good starting point.



1B. Rear Seat Struts

Each Kosmic Kart is supplied with two (2) supplemental seat struts, one (1) for each side. The extra seat struts are designed to be fixed atop the rear axle cassette and then fastened to the seat with the provided hardware. A good place to start is using one (1) on each side. Many drivers prefer to use two (2) on each side, which will effectively force more direct-pressure from the driver's weight transfer on the rear tires. This will consequently improve grip to the rear of the chassis.

By removing seat struts you allow for the rear of the chassis to release and spring off the track easier. This can be an added benefit when attempting to improve the chassis performance during cornering. Be careful though, by removing seat struts, the initial cornering may improve, but the potential to create an over-steer on exist will become more prevalent as well as the overall balance of the chassis.

J3 has several lengths of seat struts, so don't rush it, get the right size!



Part Number	Product Description
0006.280	SUPPLEMENTARY SEAT'S SUPPORT 280 mm
0006.300	SUPPLEMENTARY SEAT'S SUPPORT 300 mm
0006.320	SUPPLEMENTARY SEAT'S SUPPORT 320 mm
0006.340	SUPPLEMENTARY SEAT'S SUPPORT 340 mm
0006.380	SUPPLEMENTARY SEAT'S SUPPORT 380 mm
0006.400	SUPPLEMENTARY SEAT'S SUPPORT 400 mm
0007.340	SUPPLEMENTARY BENT SEAT'S SUPPORT 340 mm



2. Front Track Adjustment

Nearly all Post-2005 Kosmic Racing Karts are sold with HST front stub axle, which has a 25mm stub in order to increase the chassis front-end grip and effectiveness.

The recommended front width is to use 3-5mm spacers on the inside of the hub (Standard 90mm HST Hub). If the track has less grip a narrow front track will improve the chassis initial reaction, however, this may cause the chassis to lose performance on longer corners. A track with medium to high grip often times requires a wider front track width in order to increase the chassis weight transfer. This also helps the chassis to be more effective on longer corners when more driver input is often times required to keep the speed up.

3. Rear Track Adjustment

We recommend always starting with the standard OTK 92mm rear hubs. Typically we will start the rear track at the maximum.

- For the senior divisions this will be 55" and for the junior divisions this will be 53 ½". (Measured from outside rear wheel to outside rear wheel). From this point the only real movement is to narrow the rear track.

- By narrowing the rear track of the chassis while leaving the front track untouched the chassis will become more effective at releasing the inside rear tires during cornering. This can initially improve the chassis performance as well as through the entire corner. However, as grip levels change a narrow rear track can also create too much 'Side Bite' thus, giving the chassis too much grip in the middle of the corner and decreasing its effectiveness. It is also recommended when the grip levels are low to test the rear track width narrower due to the potential increase in 'Side Bite' from the tire. Rear width can sometimes be complicated in regards to the effects it has on the chassis performance, therefore, make minute changes when adjusting. And one of the major factors with rear width is chassis balance 'Feel'. Some drivers do not like to drive on a chassis with a narrower rear track width, so know your driver.

4. Caster / Camber adjustments

Caster and Camber can be adjusted at the front-end of the chassis. Depending on which model Kosmic Racing Kart you have, there will be either 4-position ball bearing adjustment, 4-position non-bearing eccentric either in D.8mm or D.10mm, or Post-2007 20-position ball bearing adjustment.

J3 recommends starting with full caster, which can be attained with the top eccentric arrow facing forward and the bottom eccentric arrow facing backwards. This will give the front-end maximum grip from a caster perspective and can possibly make the chassis more difficult to turn as well. This is the most often setup regarding the caster position.



The eccentrics can be rotated to reduce the amount of caster, which will make the chassis easier to steer and it will remove front-end grip as well. The Front-end geometry can effect the chassis in many different ways as well depending upon the track conditions. We recommend keeping it basic until you are familiar and comfortable making these changes to your chassis.

2008 Kosmic Eccentric! Notice the Added Adjustment Holes!



Part Number	Product Description
0211.DOKIT	COMPLETE HST EXCENTRIC BUSH D.22-10 New - 2008
0211.C0	INTEGRAL EXCENTRIC BUSH HST
0212.C0	INTEGRAL CONCENTRIC BUSH HST
0212.A0KIT	COMPLETE CONCENTRIC BUSH D.22
0211.A0KIT	COMPLETE EXCENTRIC BUSH D.22

5. Front-End Ride Height Adjustments

The Kosmic Racing Kart has three (3) washers that are placed between the stub axles and the ‘C’ on the Front-end of the chassis. Two (2) of the washers are special 4mm thick washers (PN 0215.00) and one (1) standard 1.5mm thick washer (PN RP 10x16x1.5). By altering these washers you will be effectively changing the front ride height. The chassis comes standard with one 4mm washer on top of the stub axle and the remaining washers below the stub axle. This is a recommended starting position at all venues.

Raising the Front Ride Height

This is accomplished by placing washers from the bottom of the stub axle and placing them on top of the stub axle. This has a positive effect on the entire chassis when the grip levels increase and the chassis begins to understeer. Essentially the front ride height has been increased so, when the steering wheel is turned the inside tire is pushed/forced further into the track thus giving the driver a more positive feel (Front-Grip) and it will result in a better handling chassis.



Lowering the Front Ride Height

The process for lowering the front ride height is the exact opposite as raising the front ride height. The advantages here are that the front-end will feel 'lighter' while losing some of its efficiencies. This can also sometimes be good on high grip tracks where the driver has troubles driving on the higher grip.

*Front-End ride height adjustments can make a big difference if applied correctly; however, this adjustment is best saved after other adjustments have been made to your Kosmic

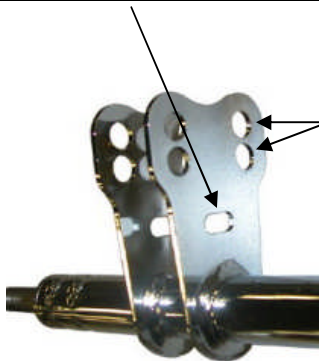
6. Ackerman and Steering Adjustments

Kosmic Racing Kart's have two (2) different types of steering columns both are 47cm. The standard steering columns part number is (PN 0005.BA). The pitman arm or mounting plate on the column has two (2) locations for fixing the tie rod tubes. The standard and most often used fixing points are the lower set of holes, this gives maximum Ackerman setting. When the tie rod tubes are located in the upper holes, Ackerman has essentially reduced. Reducing the Ackerman will effectively make the steering lighter and easier for driver physically; however, this will also reduce the radius at which the front wheels turn making the front end less effective and responsive to input from the driver throughout the turning process.

The second steering column available in 47cm is (PN 0005.F0). The pitman arm on this column is longer, thus moving both sets of holed further away from the column, which increases the grip and responsiveness of the chassis front-end.

! Notice the 'Slot'! – This indicates the 47cm column with added Ackerman

! Notice the two sets of holes!





7. Rear Ride Height Adjustments

Kosmic Karts that have been produced from 2006 and beyond are equipped with a three (3) position rear carriage adjustment. This is a nice feature with gives the owner ample room to adjust the rear axle of their chassis. Each chassis comes standard with the axle placed in the center position of holes. We highly recommend starting with the rear ride height in the center and adjusting as needed once at the track. Typically the adjustments here are not very frequent, however, when adjustments are made and in the right direction positive gains will be found on the stopwatch.

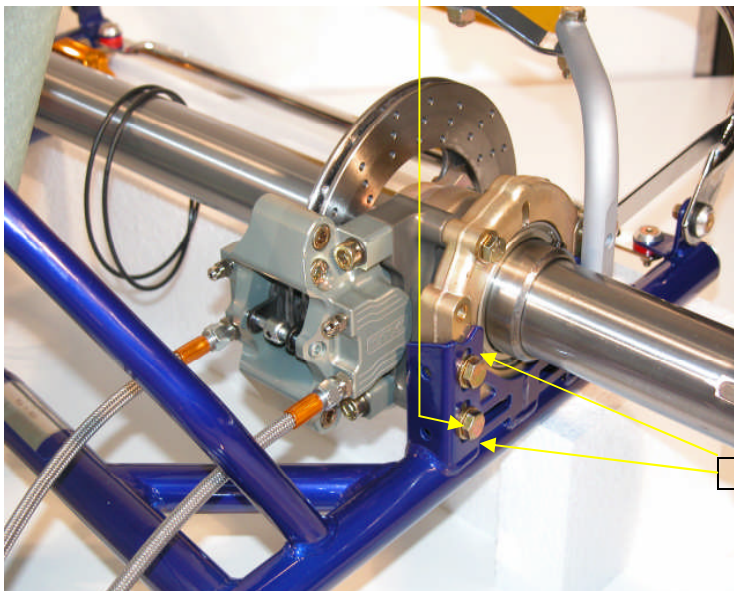
Lowering the Rear Ride Height

This essentially means raising the axle to the top set of holes, which will conversely lower the chassis position to the track surface. The typical reasoning behind this move is to 'free' the back of the chassis, therefore, reducing the grip level. How does this work? Essentially by doing so you have reduced the chassis effort to release or lift the inside rear tire during cornering, which can be crucial in optimizing a racing Karts performance (*Note: Lifting the inside rear tire too much, will cause more negative problems than being a benefit*) The benefit of this move will be noticed under braking also, with the chassis closer to the track surface, general braking will result in a less nervous chassis.

Raising the Rear Ride Height

This is an option than can yield effective results, but rarely. This change will increase the chassis rear grip level.

! Notice the chassis is in the center position!



! Notice the additional holes for adjustment!



8. Tire Pressures

<i>Class</i>	<i>Compound/Make</i>	<i>Cold</i>	<i>Hot</i>
Cadet	Bridgestone YHC	<i>Vary</i>	12.5psi / .85 Bar
100cc Junior	Bridgestone YHC	<i>Vary</i>	12.5psi / .85 Bar
TaG Senior	Bridgestone YHC	<i>Vary</i>	12.5psi / .85 Bar
ICA	Bridgestone YJB	<i>Vary</i>	11.5psi / .75-.8 Bar
125cc/KZ/ICC	Bridgestone YJB	<i>Vary</i>	11.5psi / .75 Bar

General rule: The higher the tire pressure is started out at, the quicker the tire will reach its optimum pressure. This will also cause the tire to have a decreased window of effectiveness. Therefore, in longer races it is better to start off at a lower pressure giving the tire a longer window of optimum operating time.

9. Axle Chart and the effectiveness

Axles are very much talked about regarding tuning a Kart and rightfully so. OTK produces six (6) axles for the 100cc category and five (5) for the 125cc gearbox category. OTK Type 'N' is the standard axle and medium stiffness for the entire range. This axle is also what each chassis comes standard with from the factory.

Which is the best axle to use when? Generally the consensus is that a softer axle (Type U) will free the chassis letting it operate more freely around the track. This may be true in some instances but typically not with the OTK material. Typically it is recommended to use a harder axle (Type H or HH) when the grip levels increase. Softer axles are recommended more for use when the grip levels are low. Why is this true? This holds true mainly due to the fact the chassis are made of soft 30mm tubular steel. With a soft chassis and a softer axle you will essentially create the tire to create "Side Bite" or the sidewall of the tire to rollover. This will cause the chassis to 'Hop' and therefore lose its effectiveness throughout the race. Keep with the 'N' axle; we use this axle 80% of the time and as the grip level increases the 'H' will work for your needs. Remember that the axle doesn't simply work outside the chassis, it also creates balance between the frame rails, and therefore, increased stiffness on your axle selection will give the chassis more balance as well.

**Axle Chart provided on the following page*

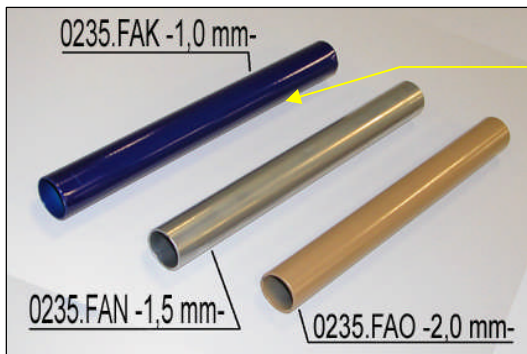


Axle Chart

Type	Size	Model	HARDNESS		Code
			SOFT	HARD	
			←—————→		
E	50x1030	DD	[Shortest bar]		0054.G0E
U	50x1030	DD	[Short bar]		0054.G0U
Q	50x1030	DD	[Medium-short bar]		0054.G0Q
N	50x1030	DD	[Medium bar]		0054.G0N
H	50x1030	DD	[Medium-long bar]		0054.G0H
HH	50x1030	DD	[Long bar]		0054.G0HH
U	50x1030	GB	[Short bar]		0054.H0U
Q	50x1030	GB	[Medium-short bar]		0054.H0Q
N	50x1030	GB	[Medium bar]		0054.H0N
H	50x1030	GB	[Medium-long bar]		0054.H0H
HH	50x1030	GB	[Long bar]		0054.H0HH

10. Tuning Bars (Front Torsion Bars)

Each chassis is supplied with a ‘Flat’ steel front torsion bar. This bar can be replaced with three (3) additional round 30mm bars made of different wall thicknesses. The added torsion bars come with a 1.0mm, 1.5mm, 2.0mm wall thickness. Each bar improves the front-end effectiveness during changing track conditions. The 2.0mm is the stiffest, which effectively allows the front-end to work better during high-grip levels; however, it will require increased input and strength from the driver as well.



Many J3 Team Drivers prefer the 1.0mm bar

Part Numbers Provided in the Picture



10A. Tuning Bars (Rear Torsion Bar)

Kosmic Racing Karts are provided with only one (1) style rear torsion bar. The bar is made of steel and measures 470mm (PN 0235.GA). The bar is round on each end at 30mm with the center being flattened to resemble a ‘Blade’. Since the rear torsion bar is manufactured in a ‘Blade’ configuration we also suggest using it in the horizontal position, thus the blade laying flat. In typical dry conditions we recommend to NOT use the rear bar. The rear bar will make the chassis more stable; however, it can cause the chassis to work the tires too much, which will result in poor tire wear and a large possibility of an understeer.

**Note: This is a good option if you are looking for added grip*

When should you use the rear torsion bar? The rear torsion bar has its main advantages in longer sweeping corners. If the track layout is made of sweeping corners try the rear bar, but only do this on applications where the Hp is greater than 100cc application.

11. Rear Hubs

The possible options for rear hubs on the Kosmic Kart are very large. They range from different lengths to different material stiffness. All Kosmic (Racing Edition) Karts come outfitted with magnesium rear hubs where Kosmic (Competition Edition) Karts come outfitted with aluminum rear hubs. We recommend the magnesium hubs since they are stiffer than the optional soft aluminum hubs. This creates added consistency as well as improved handling and driver feel as well. Below is a breakdown of the different options:

OTK – Part Number	Description	Material Type
0046.KE	WHEEL'S BOSS AL D. 50 X 56	Aluminum
0053.KE	WHEEL'S BOSS AL D. 50 X 92	Aluminum
0046.E0	WHEEL'S BOSS MG D. 50 X 56	Magnesium
0053.E0	WHEEL'S BOSS MG D. 50 X 92	Magnesium
0053.F0	WHEEL'S BOSS MG D. 50 X 148	Magnesium

Each Kosmic Kart comes standard with either 50 x 92 rear hub. This hub is recommended for primary use. Using either the 56mm or 148mm rear hubs are great options as well. The 56mm rear hub will allow the wheel and tire to flex more creating the potential for a better outcome on lower Hp applications. The largest hub, 148mm, is only used and recommended for use in gearbox applications or on a wet track. This hub adds more rear grip and stability, which are often times required by larger Hp applications.

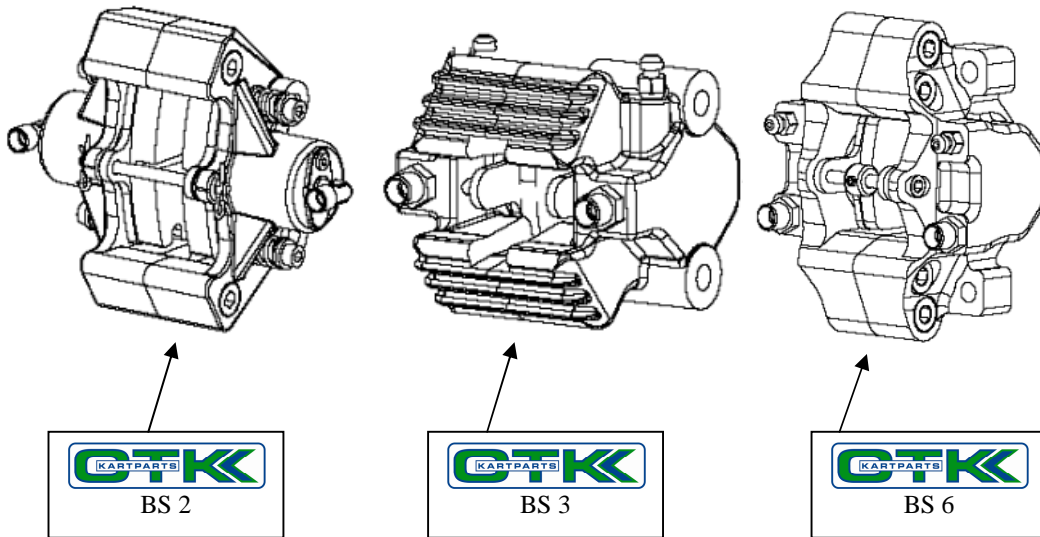
→ *“This Hub is the best option nearly all the time” – J3*

12. Braking Systems (Rear)

Depending on the year of production, your Kosmic Racing Kart may have several different braking systems. All braking systems are equipped with highest of quality standards as well as CIK/FIA Homologated. Typically any chassis purchased later than 2006 will come fully equipped with the BS6 rear caliper and for gearbox applications the BS6 with its counterpart the BS5 system.

In order to simplify the situation we have provided an estimated time line detail the braking system you may have:

Production Year	Part Number	Product Description	System Type
2000 - 2003	0082.KA	COMPLETE HYDRAULIC REAR BRAKE CALIPER	BS 1-2
2003-2005	0082.DA	COMPLETE HYDRAULIC SELF-ADJUSTING REAR BRAKE CALIPER	BS 4
2005-2008	0082.EA	COMPLETE HYDRAULIC SELF-ADJUSTING REAR BRAKE CALIPER	BS 6



*Brake Fluid requirements are as follows:

Fluid	System
Dot 4	BS1-2
Dot 4	BS 3
Dot 5	BS 5/6

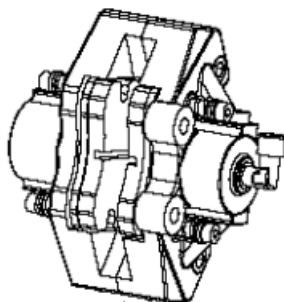


12b. Braking Systems (Front)

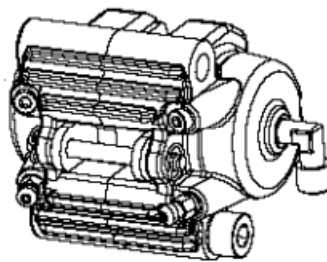
Depending on the year of production, your Kosmic Racing Kart may have several different braking systems. All braking systems are equipped with highest of quality standards as well as CIK/FIA Homologated. Typically any chassis purchased later than 2006 will come fully equipped with the BS6 rear caliper and for gearbox applications the BS6 with its counterpart the BS5 system.


In order to simplify the situation we have provided an estimated time line detail the braking system you may have:

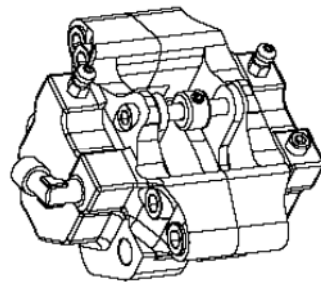
Production Year	Part Number	Product Description	System Type
2000 - 2003	0100.BA	COMPLETE HYDRAULIC FRONT BRAKE CALIPER	BS 1-2
2003-2005	0100.DA	COMPLETE HYDRAULIC SELF-ADJUSTING FRONT BRAKE CALIPER	BS 3
2005-2008	0100.EA	COMPLETE HYDRAULIC SELF-ADJUSTING FRONT BRAKE CALIPER	BS 5





BS 1




BS 4

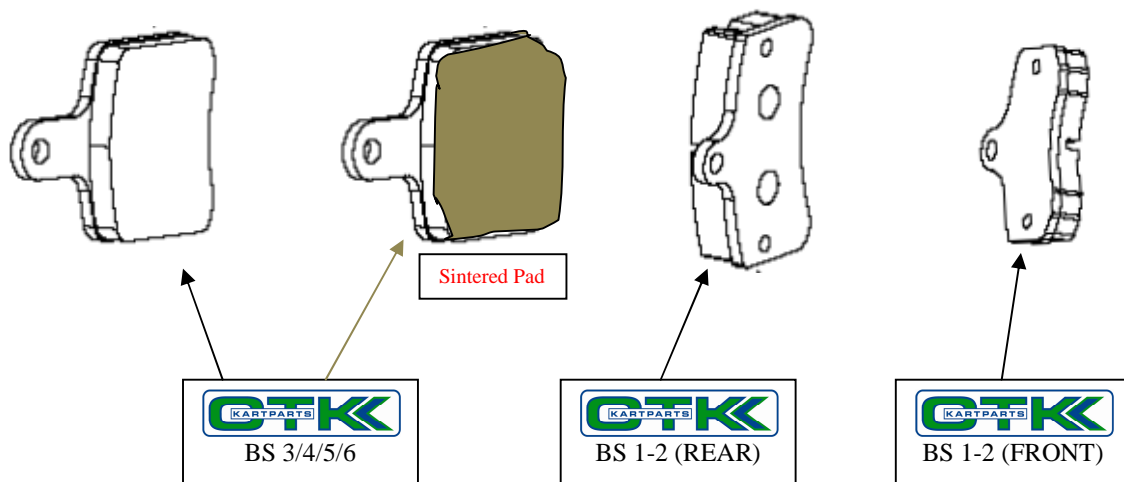



BS 5

12c. Brake Pad Identification

With the several different braking system options, there are corresponding brake pads for each system. The unique advantages to the OTK braking systems are that the BS3/4 and BS 5/6 all require the same brake pad for the front and rear. The BS 1-2 system is the only system that calls for separate rear and front brake pads.

Part Number	Product Description	System Type
0082.B4	REAR BRAKE PAD	BS 1-2
0100.B4	FRONT BRAKE PAD	BS 1-2
0082.D4	REAR/FRONT BRAKE PAD	BS 3/4/5/6
0082.D4A	REAR/FRONT BRAKE PAD SINTERED	BS 3/4/5/6

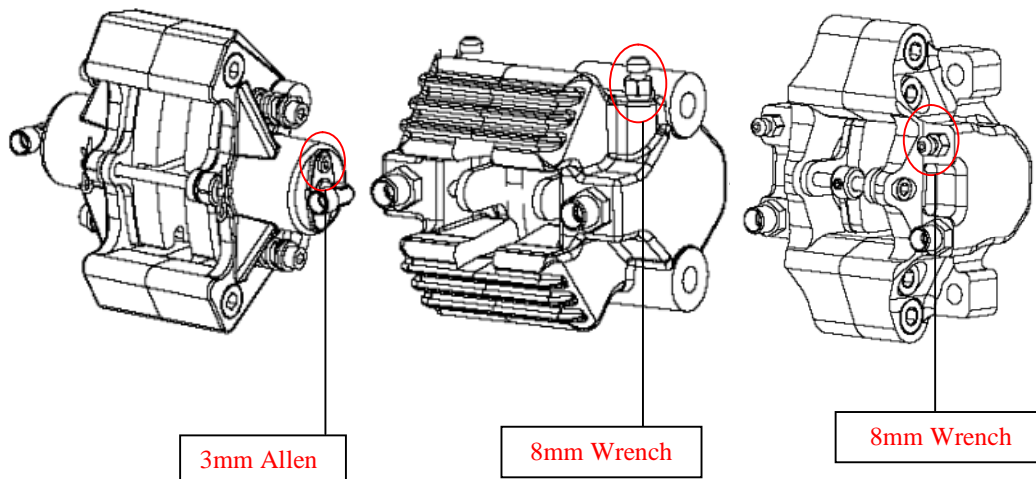


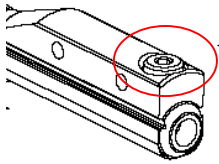
12d. Brake Bleeding

When bleeding your make sure have the proper OTK brake bleed kit (PN 0156.00). This tool enables for an effective and efficient job. Here are the steps required.

1. Take a 5mm Allen wrench and remove the braking pumps discharge plug
2. Insert your OTK Bleeding Kit by carefully begin screwing it into the fitting.
3. Once secure, remove the top cap on the Bleeding Kit and turn the valve to the 'On' Position'
4. Now, move to the rear caliper and underneath the bleeding screws place a rag (in order to absorb any residue and spillage).
5. Once complete remove the bleeding screw and let the bleeding kit force all the air out of the brake line
6. Once the air appears to be gone, insert the bleeding screw.
7. Repeat this step for each brake pump on the chassis
8. When finished make sure that you have securely tightened the discharge plugs.

***Highlighted are the Bleeding Screws on the various caliper models**





Pump's Discharge Plug (5 mm Allen)

13. Basic Wet Weather Tips

Most of the time, the dreaded rain comes and the change over from dry to wet setup is rushed with only a 15-25 minute window to make the changes. What can be done in such a short window of time? Actually, a lot, almost everything you will need to do.

Wet Conditions

- Wide the front hubs as far as possible
- Narrow the rear track width so the center line of the rear tire matches the center line of the front tire
- Loosen the extra seat struts, you can keep them on, but make sure they are loose with the nut barely attached (so it will not fall off)
- Remove the front torsion bar (and rear if you were running it in the wet)
- Loosen the floor tray bolts
- Adjust the front-end geometry to 4mm open toe-in

**This will be a very good starting point*

Very Wet Conditions

- Wide the front hubs as far as possible (Install Longer Front Hubs if Possible)
- Narrow the rear track width so the center line of the rear tire matches the center line of the front tire (Use shorter rear hubs 56mm)
- Loosen the extra seat struts, you can keep them on, but make sure they are loose with the nut barely attached (so it will not fall off)
- Remove the front torsion bar (and rear if you were running it in the wet)
- Loosen the floor tray bolts
- Adjust the front-end geometry to 4mm open toe-in
- Raise the front ride height
- Install a softer axle or try raising the rear axle
- Remember if the track has sweeping corners, try the rear bar. It will lose efficiency in the slower corners, but the gains in the long sweeping corners may offset the difference?
- Try to also raise the seat in an attempt to bring the driver's center of gravity higher

**This will be a very good starting point*

! Notice the Longer Front Hub for added Grip!



14. Conclusion

J3 Competition is committed to making all Kosmic Racing Kart owner's champions and race winners. We hope this informative 'Knowledge Packet' will further help our customer's understand the basic workings of their chassis. J3 Competition's technical line is always available for any clarification(s) or added understandings regarding the material found in this packet or additional information required.

The information in this packet is 'general knowledge' and may not apply to all owners or track conditions encountered. Keep in mind that trial and error is still a great means of understanding the Kosmic material. Our aim is lessen the learning curve and instill our knowledge and assets to help our customers reach their desired results at a greater rate!

THANKS AGAIN