

ARROW



Kart Setup Guide

Arrow Karts Owners Manual



Drew Price Engineering Pty Ltd
57-59 Nantilla Road, North Clayton VIC 3168 Australia
PO Box 4105 Mulgrave VIC 3170 Australia
Tel. (03) 9545 3944 Fax (03) 9545 3743
(Int'l: Tel. +61 3 9545 3944 Fax +61 3 9545 3743)
www.dpeng.com.au karts@dpeng.com.au



Contents

- 2** Axle Bearing Adjustment
- 2** Height Adjustment of Rear Axle
- 3** Height Adjustable Stub Axles
- 4** Brake Adjustment
- 5** Crash Bar Adjustment
- 6** Front End Alignment
- 9** Front Track
- 10** Rear Track
- 12** Seat Stays
- 13** Adjustable/Removable Torsion Bars
- 15** Tyre Pressures
- 16** Seat – Fit and Position
- 17** Weighting Kart
- 17** Wet Weather
- 18** Rear Wheel Hubs
- 19** Brake Maintenance
- 20** Fitting Tyres
- 21** Front Wheel Alignment
- 21** Use and Safety guide
- 23** Owner registration card
- 25** Gear ratio chart
- 26** Maintenance Schedule
- 28** Troubleshooting Question & Answer Index

TAKE NOTE...

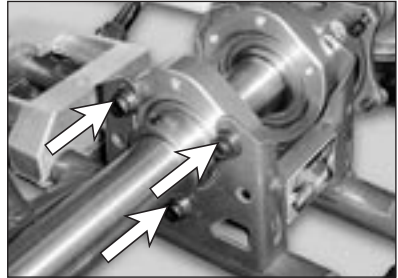
Before making any adjustments be sure to test your Arrow in its recommended standard setup. It is essential to make only one adjustment at a time.

Axle Bearing Adjustment

1. AXLE BEARING ADJUSTMENT

Problem: "Lack of rear grip"

Solution: On Arrow karts using a 3 bearing rear axle design, under certain conditions where grip level is low extra grip may be gained by loosening the centre bearing. Remove the 3 bolts from the alloy bearing flange and loosely fit three cable ties through these holes. If you have seat stays fitted you will need to remove the seat stay from the alloy-bearing flange.



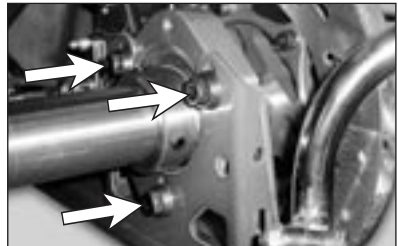
2. HEIGHT ADJUSTMENT OF THE REAR AXLE

Problem: "Kart is two wheeling excessively through corners" (i.e. both inside wheels are 10cm off the track surface)

Solution: Raise axle in chassis.

Problem: "The back slides/the kart oversteers going into the turns"

Solution: Make sure the back axle is located full down in the chassis (i.e. the kart with maximum rear ride height)



Why?

With the Arrow karts that allow height adjustment of the rear axle, 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.

Note: As the general rule the axle should always be left fully down in the chassis as the kart's normal setting. Only when track conditions start making the kart two wheel excessively through corners should the axle be raised in the chassis.

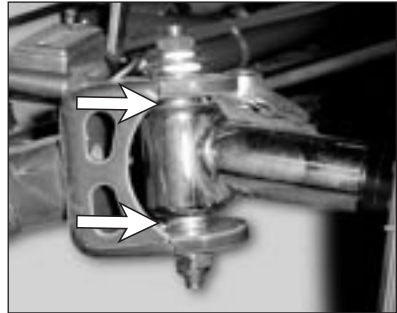
Height Adjustable Front Stub Axles

Problem: "The back slides/the kart oversteers going into the turns"

Solution: Raise the front ride height i.e. lower the front stub axles in the chassis by one spacer at a time

Problem: "There is too much steering or front end bite on turn-in"

Solution: Lower the front ride height i.e. raise the front stub axles in the chassis by one spacer at a time.



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. The effect on the kart will be to make it a little slower with its first-off reaction on initial steering wheel input but from then on in the front will have more grip into the apex. The effect of having moved the c/g. back will be to create more back end grip throughout the whole corner as well as making the rear of the kart sit flatter.

Be careful of this as you might start feeling that your engine is going off, losing pull off of the turns but the kart feels great. Wrong, the kart is sitting too flat through the corner. It's not allowing a "differential effect", by lifting the inside (unloaded) back wheel off the track through the apex, pulling the engine down which is trying to drive both back tyres through differing 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

1. PAD WEAR ADJUSTMENT

Problem: "The engine has no top end speed"

Solution: Verify the brakes are not dragging. If needed, increase the gap between the rear brake pads and the disc by removing shims between the caliper piston and the brake pad.

Problem: "Excessive pad clearance between each pad and the disc"
(Pad adjustment is necessary when the clearance between each pad and the disc exceeds 3mm)

Solution: 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.

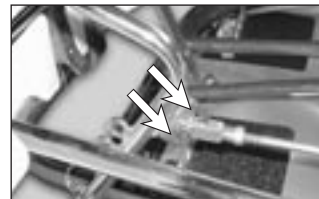


Note: The minimum clearance between each pad and the disc should be 1.5mm. Arrow karts brakes are supplied with 4 adjustment shims (2 x 0.5mm thick and 2 x 1.0mm thick) making adjustment simple.

2. PEDAL PRESSURE ADJUSTMENT

Problem: "Brake pedal pressure does not suit my driving style"

Solution: On the pedal there are three positions available for the brake actuating linkage. The higher the setting the more pedal pressure required. A lower setting will make the brake more sensitive and require less pedal pressure. On the master cylinder there is two positions available. The higher setting will produce a more sensitive brake requiring less pedal pressure.



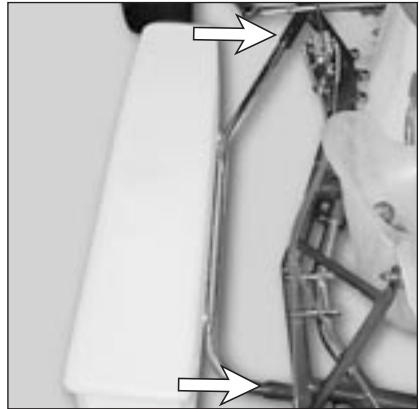
Crash Bar Adjustment

Problem: "Understeer from the apex and out of the corner"

Solution: Loosen or remove the bolt at the front mounting point of both side-pod supporting bars to the chassis.

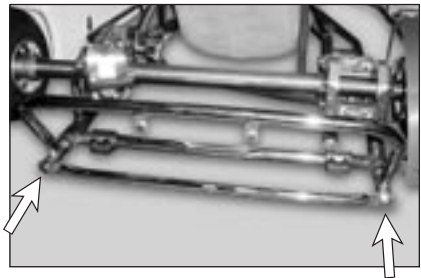
Side Pod Bars:

Have these tightened for most conditions. Loosening these will reduce grip and can also assist in reducing understeer.



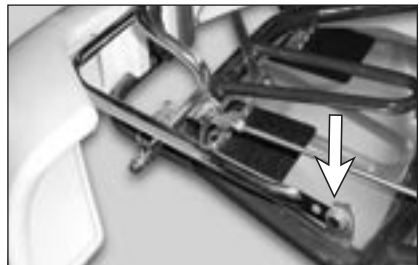
Rear Crash Bar:

The rear crash bar must always be kept securely tightened.



Front Crash Bar:

The top bolts securing the front bar with a rubber spacer are best left firmly tightened but not over tight. Loosening the front bar will reduce the front steering/grip.



Front End Alignment

1. ADJUSTABLE ACKERMAN

Problem: "My engine lacks mid-range punch when applying throttle from the apex of the corner"

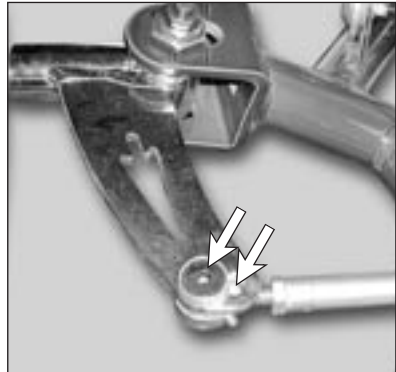
Solution: Increase the amount of Ackerman by moving the steering links to the inner mounting holes on the stub axles

Problem: "The back slides/the kart oversteers going into the turns"

Solution: Reduce the Ackerman setting by one hole on the stub axles.

Problem: "There is too much steering or bite on turn-in"

Solution: Reduce the Ackerman setting by one hole on the stub axles.



Why?

A) Adjustable Ackerman on the Stub Axles' Steering Arms

Arrow karts 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 being run on 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 tyre of your kart, the second mark being the inside front tyre 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 tyre is going through a smaller diameter arc than the outside tyre. All things being equal, the inside front tyre 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.)

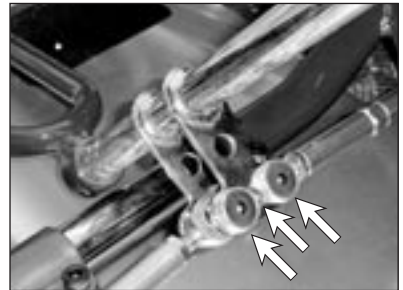
Front End Alignment

On the track increasing Ackerman has the effect of increasing 'turn-in' of your kart. It forces the inside front tyres 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 tyre through a corner while at the same time increasing the mechanical grip of the outside back tyre. This is all good stuff but like all good things in life too much can be bad!

On a track which offers a lot of 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. It's like setting the kart with toe-out where the front tyres 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 tyre 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").

B) Adjustable Ackerman on the Steering Column

All Arrow karts 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

2. ADJUSTABLE CAMBER AND CASTER

Problem: "The back slides/the kart oversteers going into the turns"

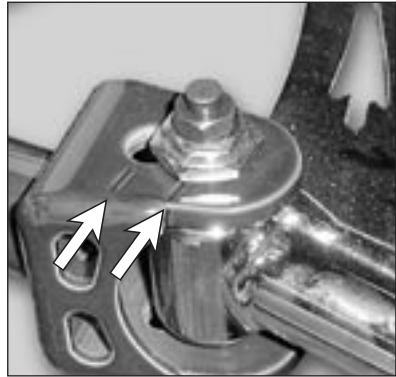
Solution: If camber/caster adjusters are fitted on the kart, reduce the caster setting.

Problem: "There is too much steering or front end bite on turn-in"

Solution: If there are camber/caster adjusters in the kart, reduce the caster.

Problem: "There is understeer all the way through the turn"

Solution: If there are camber/caster adjusters in the kart, increase the caster.



Why?

Arrow karts are all supplied with camber/caster adjusting concentric king pin-locating washers as standard. They come from the factory with the camber/caster set in its neutral position. 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 Arrow kart there are three possible caster settings while retaining the kart's standard camber setting:

- **Minimum Caster** – Both indicator lines facing to the back of the kart;
- **Maximum Caster** – Both indicator lines facing to the front of the kart;
- **Central or Neutral Caster** – Top indicator line pointing to the back with the bottom indicator line pointing to the front of the kart.

By moving the indicator lines 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' tyres: Zero (meaning both front tyres should be the same top to bottom).

'Open' CIK Homologated tyres: 0-2mm positive (meaning both front tyres should be straight up and down or up to a maximum of 2mm wider apart at their tops than their bottoms).

Front Track

Problem: "Understeer on turn-in to the apex of the corner"

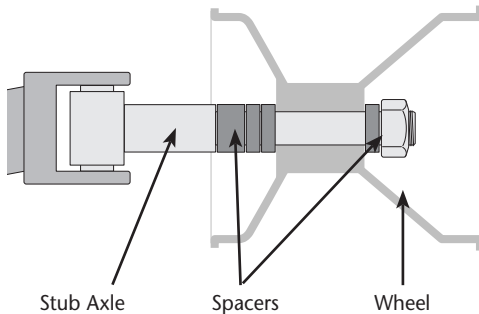
Solution: Widen the front track by a 5mm spacer at a time.

Problem: "Oversteer or very sensitive front steering causing the rear to slide."

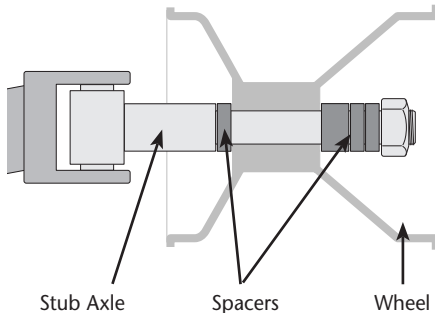
Solution: Narrow the front track width by a 5mm spacer at a time.

FRONT WHEEL SPACER ADJUSTMENT

Wheel Further Out (more spacers inside wheel)



Wheel Further In (less spacers inside wheel)



For setting the front track width, a good starting point is.

'Open' type tyres – 1 x 20mm spacer and 1 x 10mm spacer on the inside of each front wheel.

'High grip' SL type tyres – 1 x 20mm spacer and 1 x 5mm spacer on the inside of each front wheel.

'SL' tyres – 1 x 10mm spacer and 1 x 5mm spacer on the inside of each front wheel.

Junior kart on 'SL' tyres – 1 x 10mm spacer and 1 x 5mm spacer on the inside of each front wheel.

Midget/Rookie – 1 x 10mm spacer and 1 x 5mm spacer on the inside of each front wheel.

Note: The above settings are for the Arrow range of karts

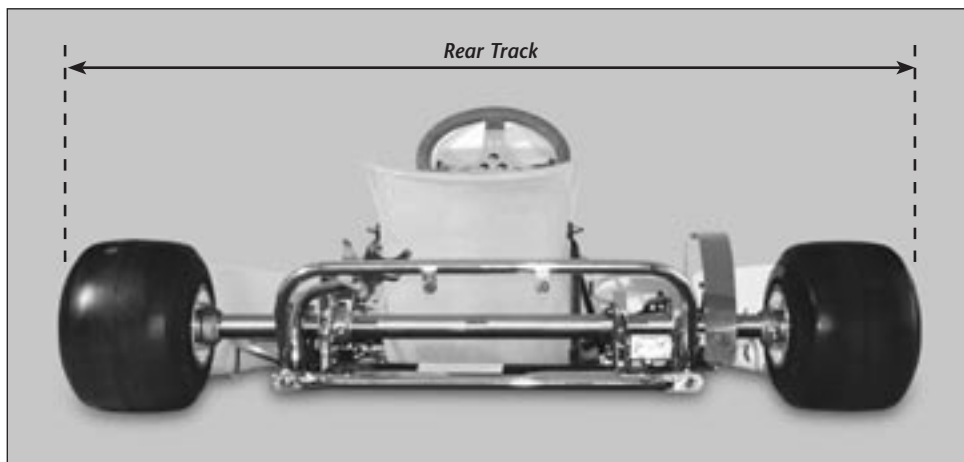
Rear Track

Problem: <i>"There's no traction/the kart is oversteering coming from the apex out of a corner"</i>
Solution: <i>Reduce the rear track width by 5mm on both sides at a time.</i>
Problem: <i>"The back slides/the kart oversteers going into the turns"</i>
Solution: <i>Increase the rear track width by 5mm on both sides at a time, being careful not to exceed the maximum regulation width overall of 1400mm.</i>
Problem: <i>"There is understeer all the way through the turn."</i>
Solution: <i>Increase the rear track width by 5mm on both sides at a time, being careful not to exceed the maximum regulation width overall of 1400mm.</i>
Problem: <i>"There is bounce in the rear."</i>
Solution: <i>Increase the rear track width by 5mm on both sides at a time, being careful not to exceed the maximum regulation width overall of 1400mm.</i>
Problem: <i>"The track is very bumpy giving the kart a lot of bounce."</i>
Solution: <i>Increase the rear track width by 5mm on both sides at a time, being careful not to exceed the maximum regulation width overall of 1400mm.</i>
Problem: <i>"The kart has a tendency to lift up on two wheels through the corners."</i>
Solution: <i>Increase the rear track width by 5mm on both sides at a time, being careful not to exceed the maximum regulation width overall of 1400mm.</i>

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.

Rear track measurement – Overall width to outside edge of rear wheels:

‘Open’ type tyres (e.g. Bridgestone YGA,)	1395mm
‘High grip’ SL type tyres (e.g. Bridgestone YGK, Maxis HG3,)	1385mm
‘SL’ tyres (e.g. Bridgestone YEQ, Vega XSL,)	1370mm
Low grip ‘SL’ tyres (e.g. Bridgestone YDS, Dunlop SL1,)	1330mm
Midget/Rookie (e.g. Bridgestone YEQ, YDS, Dunlop SL1,)	1115mm

Note: The above settings are for the Arrow range of karts

Seat Stays

Problem: *“There’s no traction/the kart is oversteering coming from the apex out of a corner”*

Solution: *Mount seat stays on either side of the seat. In certain applications 2 sets of seat stays can be fitted.*



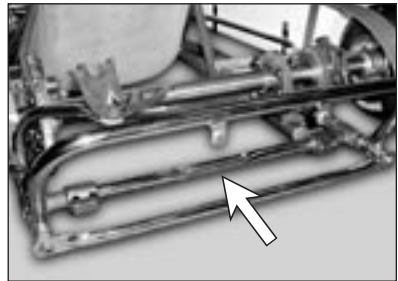
Note: *Additional seat stays are available which fix to the axle bearing flanges and the top section of the seat. Testing has shown these to be advantageous under certain conditions and a disadvantage under others.*

Adjustable/Removable Torsion Bars

Problem: *“There’s no traction/the kart is oversteering coming from the apex out of a corner”*

Solution:

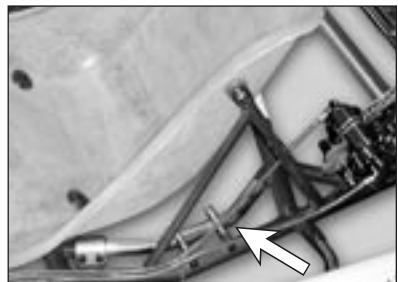
1. *Running the rear torsion bar “full stiff” (i.e. with the blade of the torsion bar set vertically to the track’s surface) will maximize rear mechanical grip as well as reducing rear chassis roll.*
2. *When karts are fitted with a removable side torsion bar or are equipped with tensioning bolts on the fourth rail, tighten the tensioning bolts completely.*



Problem: *“There is understeer all the way through the turn.”*

Solution:

1. *Turning the rear torsion blade bar towards the horizontal position will reduce rear mechanic grip while increasing rear chassis roll.
If the rear torsion bar is already “full soft”, remove the bar completely.*
2. *In the case that they are fitted, remove the tensioning bolts from the side torsion bar/fourth rail.
If the tensioning bolts are already removed from the side torsion bar then remove the torsion bar all together from the kart.*



Adjustable Torsion Bars

Why?

1. Removable Front Torsion Bar

Removable front torsion bar is a set-up affecting mechanical grip on the front tyres. 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 altogether.

Some Arrow karts also provide the ability to remove the fourth rail/side torsion bar completely. Having the side bar fitted in your Kart will normally provide more grip. Conversely, removing this torsion 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. Arrow karts 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.

Firstly remember, when racing in the wet always start with the torsion bar fitted in the kart and the torsion bar "blade" set full stiff. 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 tyres a better chance of maintaining contact with the surface.

Tyre Pressures

<i>Problem: "The engine has no top end speed"</i>
<i>Solution: Raise rear tyre pressures by 0.05bar/1 P.S.I.</i>
<i>Problem: "The back slides / the kart oversteers going into the turns"</i>
<i>Solution: Raise the rear tyre pressures by 0.05bar/1 P.S.I.</i>
<i>Problem: "There is too much steering or front end bite on turn-in"</i>
<i>Solution: Lower front tyre pressures by 0.05bar/1 P.S.I.</i>
<i>Problem: "There is understeer all the way through the turn."</i>
<i>Solution: Raise the front tyre pressure by 0.05bar/1 P.S.I.</i>
<i>Problem: "Understeer on turn-in to the apex of the corner"</i>
<i>Solution: Raise the front tyre pressures by 0.05bar/1 P.S.I.</i>
<i>Problem: "Understeer from the apex and out of the corner"</i>
<i>Solution: Lower rear tyre pressures by 0.05bar/1 P.S.I.</i>

Note: Due to the many specifications and compounds of kart tyres on the market today, we suggest you seek information from your kart dealer or the particular tyre distributor.

Tyre Preparation

When talking about a new set of 'SL' type tyres, we recommend that you firstly do a 10-lap session at 1/2 pace, (i.e. working the tyre without sliding in the corners.) Allow the tyres to cool down before further use.

Seat – Fit and Position

Problem: “There’s no traction / the kart is oversteering coming from the apex out of a corner”

Solution:

1. Move the whole seat a little more upright and back by 12mm or 1 position on Arrow models with adjustable seat brackets.
2. Replace the seat with a unit that is stiffer diagonally across the seat

Problem: “Understeers from the apex and out of the corner.”

Solution:

1. Move the seat 12mm further forward or one position on Arrow models with adjustable seat brackets.
2. Replace the seat with a unit that is softer diagonally across the seat

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 Kartech (for ‘SL’ type tyres) or Arrow Euro (for high grip ‘SL’ or ‘Open’ type tyre) 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. With an Arrow kart, once you’ve got the correct seat, depending on its size and the model Arrow kart you’re fitting it in to, the **Seat Position diagram and chart** included with this Manual (if buying a new kart) will help you ascertain the correct measurements you’ll need, or refer to our website at www.dpeng.com.au.

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. Arrow 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. Using Arrow spacers, we suggest using a mixture of the 7mm plastic spacer with the 7mm & 12mm aluminium seat washers, as needed, plus the Arrow plastic seat “wedge”. It is important that only a maximum of one plastic 7mm seat spacer plus the plastic seat wedge is used on each side of the seat. The plastic seat wedge, once fitted, should be rotated to provide good alignment between the seat and seat bracket surfaces.

As an example, on an Arrow kart we recommend:

Against the seat: Large o.d. washer

Next: 7 or 12mm alum. spacer as required*,

Next: 1 x 7mm plastic spacer if required*,

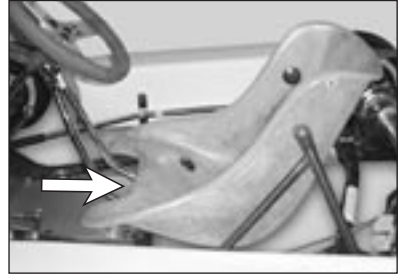
Next: plastic seat wedge.

**Note: the quantity/thickness used will vary depending on the seat size being fitted.*

Under the front of the seat only plastic seat spacers should be used as packing between the seat and the welded chassis mounting tabs in obtaining the correct relevant measurements.

Weight 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). 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 TYRES (HARD COMPOUND SL):

- **Front Track:** Move front wheels out as far as possible.
- **Rear Track:** Leave as per your dry setting or move hubs inwards 10mm each side. Narrowing the rear track too much will result in front understeer.
- **Caster Adjustment:** If time permits, adjusting to maximum caster (indicator lines to front of kart) will reduce understeer.
- **Tyre Pressure**

Extreme wet conditions:	25-30psi	1.7-2.05kg/cm ²
Moderate wet conditions:	20-25psi	1.35-1.7kg/cm ²
Drying conditions:	15-20psi	1.0-1.35kg/cm ²

WET TYRES (SOFT COMPOUND):

- **Front Track:** Move front wheels out as far as possible.
- **Rear Track:** Leave as per your dry setting or move hubs inwards 10mm each side. Narrowing the rear track too much will result in front understeer.
- **Caster Adjustment:** If time permits, adjusting to maximum caster (indicator lines to front of kart) will reduce understeer.
- **Tyre Pressure**

Front:	12 P.S.I.	0.80 kg/cm ²
Rear:	14 P.S.I.	0.95 kg/cm ²

Handy tip for Arrow owners: Make sure you equip yourself with a set of Kartech stub extensions for wet weather. These enable an immediate increase of 60mm to your front track. The difference is incredible, improving both steering and rear grip significantly. An absolute must.

Rear Wheel Hubs

Problem: "Understeer from the apex and out of the corner"

Solution: Replace the rear wheel hubs with shorter units.

Problem: "There's no traction/the kart is oversteering coming from the apex out of a corner"

Solution: Replace the rear wheel hubs with longer units.

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 fact increasing or decreasing the amount of "working" axle. In other words, the length of axle between the kart's main chassis rails and the wheel assemble that is left clear to flex un-unhindered.

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 of changing to longer or shorter hubs is a major advantage in trying to obtain the ultimate kart balance. Different length wheelhubs are available and these can be utilised to further fine-tune your kart's handling to your individual liking



Note: If your Arrow is fitted with a 40mm axle the wheelhubs incorporate a unique design with a wheel-locating insert. Fit the insert if you have your wheelhubs over the end of the axle and remove the insert if you want to slide your wheelhubs further inwards for a narrower rear track. **Important:** To remove the insert slide your wheelhub onto the axle and tap the insert against the end of the axle until it falls out. When the insert is fitted ensure it is fitted fully into the hub before fitting your wheel. If the insert is sitting against the end of the axle and protruding from the wheelhub this will stop your wheel from fitting correctly and will cause the wheel to come loose.

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

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

Solution: *With the 125cc gearbox karts, adjust the brake bias to 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 brake's 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. Not checking might!

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.*

2. Ensure the master cylinder lever always has 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.

Brake Maintenance

- 3. 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 brake if you are unable. "Don't wait for a failure – preventative maintenance is much wiser."*
- 4. Arrow karts are supplied with brake pads developed over 2 years of extensive testing. Don't use substitutes as they could affect your brake disc and result in poor braking performance. The correct part no. is BDHL7 or BDHL 5.*
- 5. 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: For the next 10 laps gradually, lap by lap, increase pedal pressure so that braking is occurring at approximately 75% of full braking by lap 20.

Session 3: Do 2 laps at approximately 75% full braking and then for the next 2 laps work the brake hard. Ride the brakes then let off the pedal for 2 seconds and ride them again. Continue this until the brakes become very hot and they start to fade away and lose stopping power. For the next 2 laps drive around very slowly and do not even touch the pedal, allowing the brakes to cool down, return to the pits and allow the brake to cool down completely before returning to the track.

Note: For a new kart or new brake disc, complete sessions 1,2 & 3.
For new pads only, complete just session 3.

Fitting Tyres

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

Note: Using the Kartech Adjustable external steel tyre ring is important as a safety issue as well as performance as they reduce the amount of pressure required to seat the tyre's bead onto the rim. Apart from the obvious safety advantage, this does stop the tyre from being stretched out of circumference or shape.

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 Arrow karts, 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 zero (meaning both front tyres are pointing dead straight ahead) as a starting point.

General Use and Safety Guide

PLEASE READ CAREFULLY

Congratulations on choosing a Drew Price Engineering Pty Ltd Kart.

Since 1973, DPE have been 100% committed to the Kart Industry. It's our life, our passion and our livelihood, so you can count on us being there when you need us.

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, perhaps even 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.

Use & Safety Guide

- 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 our Company authorise 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
- Goggles
- 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

As this is a racing/competition vehicle no Warranty or Guarantee, either written or implied, exists.

NEVER drive your Kart on any public highway, freeway, street or road. Doing this is illegal and extremely dangerous. If you decide to resell or pass on your Drew Price Engineering Pty Ltd Kart it is your responsibility to pass on all the Safety maintenance information to the next owner/operator. In the event of an accident, failure to pass on this information may mean you are held legally responsible.

Finally, we wish you many hours of fun, excitement and enjoyable racing. These guidelines are to help you make it as safe as possible.

Owner Registration Card



Important: This card must be filled out by the Kart Dealer selling the kart and forwarded to Drew Price Engineering Pty Ltd.

It is essential this registration card is on file should any queries require future attention by DPE.

Kart Dealer Name _____

Owners Name _____

Address _____

Owner's Phone Number Business (____) _____

A/Hours (____) _____

Age of owner 7-15 16-20
 21-25 26-30
 31-35 36+

Number of years karting _____

Date Kart Purchased _____ Chassis Number _____

Class in which the kart will be raced _____

Has the purchaser owned a DPE Kart previously _____
(If so, which model/s)

What other brand of kart has the owner previously owned _____

**Please remove this card and return to: Drew Price Engineering
PO Box 4105
Mulgrave VIC 3170**

Gear Ratio Chart

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

Suggested Maintenance Schedule

ITEM	AFTER RUNNING IN	AFTER EVERY RUN	EVERY RACE MEETING			AS REQ'D	AFTER 1 SEASON or 1,000km	REMARKS
			1 MEET or 100km	3 MEETS or 300km	5 MEETS or 500km			
Axle Inspection	•		•					
Axle Bearing:								
Inspection	•		•					
Retighten	•		•					
Replacement						•		
Bearing Grub Screws:								
Inspection	•		•					
Retighten	•		•					Torque: 5Nm (0.5m.kg, 3.6ft.lb)
Bolts & Nuts:								
Retighten	•		•					
Brakes:								
Inspection (disc)	•		•					Runout Limit 1mm (0.04")
Inspection (pad clearance)	•		•					Clearance to disc 2.0mm maximum
Inspection (fluid leaks)	•		•					
Inspection (brake fluid level)	•			•				
Inspection (brake response)	•	•						
Retighten	•		•					
Replacement (brake pads)						•		Refer to Brake section. Max. pad wear before replacement 4mm
Replacement (brake fluid)					•			
Brake Disc Hub	•		•					Lubricate threads
Cables:								
Inspection (brake cable)	•		•					
Inspection (throttle cable)	•		•					
Replacement						•		
Chain:								
Inspection	•	•						
Lubricate	•	•						
Replacement						•		
Chain Guard:								
Inspection	•		•					
Replacement						•		

ITEM	AFTER RUNNING IN	AFTER EVERY RUN	EVERY RACE MEETING			AS REQ'D	AFTER 1 SEASON or 1,000km	REMARKS
			1 MEET or 100km	3 MEETS or 300km	5 MEETS or 500km			
Chassis, including all welds:								
Inspection	•		•					Immediately following any crash/contact
Cleaning	•		•					
Drive Sprockets:								
Inspection	•		•					
Replacement						•		
Engine:	<i>Refer to Owners Manual Maintenance Schedule</i>							
Engine Mount Clamps:								
Retighten	•		•					
Inspection (red nylon inserts)					•			Replace after 5 race meetings
Fuel line/Fuel tank:								
Inspection (tank)	•		•					Check inside tank that fuel pickup has not come adrift from the outlet fitting
Inspection (hose)	•		•					
Cleaning (tank)	•			•				
Replacement (hose)	•				•			
Sprocket Hub:	•		•					Lubricate threads
Steering System:								
Inspection 1 (movement)	•		•					
Inspection 2 (damage)	•					•		Immediately following any crash/contact
Retighten	•		•					
King Pins	•		•					Must be tight, but do not overtighten. Replace if movement of stub on king pin is evident
Inspection (tie rod ends)				•				Replace if worn
Rear Bumper:								
Inspection	•		•					
Retighten	•		•					
Wheels/Tyres:								
Air pressure	•	•						
Inspection (wheels, inc. bearings)	•		•					
Inspection (rear wheel hubs)	•		•					Lubricate threads
Retighten (wheels)	•		•					
Replace (wheels)						•		
Replace (tyres)						•		

Troubleshooting Question and Answer Index

PROBLEM	POSSIBLE SOLUTION/S	PAGE	
HANDLING			
<i>Rear grip (lack of)</i>	<i>Axle Bearing Adjustment</i>	2	
	<i>Rear Track Adjustment</i>	10	
	<i>Seat Stays</i>	12	
	<i>Adjustable/Removable Torsion Bars</i>	13	
	<i>Seat – Fit & Position</i>	16	
<i>Rear End ‘bounce’</i>	<i>Rear Track Adjustment</i>	10	
<i>Kart is ‘two wheeling’ excessively</i>	<i>Height Adjustment of Rear Axle</i>	2	
	<i>Rear Track Adjustment</i>	10	
<i>OVERSTEER – General</i>	<i>Front Track Adjustment</i>	9	
<i>OVERSTEER – into turns</i>	<i>Height Adjustment of Rear Axle</i>	2	
	<i>Height Adjustable Stub Axles</i>	3	
	<i>Adjustable Ackerman</i>	6	
	<i>Adjustable Camber/Caster</i>	8	
	<i>Tyre Pressures</i>	15	
<i>OVERSTEER – out of turns</i>	<i>Rear Track Adjustment</i>	10	
	<i>Seat Stays</i>	12	
	<i>Adjustable/Removable Torsion Bars</i>	13	
	<i>Seat – Fit & Position</i>	16	
	<i>Front Track Adjustment</i>	9	
<i>UNDERSTEER – into turns</i>	<i>Rear Track Adjustment</i>	10	
	<i>Tyre Pressures</i>	15	
	<i>Adjustable Camber/Caster</i>	8	
<i>UNDERSTEER – through turns</i>	<i>Rear Track Adjustment</i>	10	
	<i>Adjustable/Removable Torsion Bars</i>	13	
	<i>Tyre Pressures</i>	15	
	<i>Crash Bar Adjustment</i>	5	
	<i>Tyre Pressures</i>	15	
<i>UNDERSTEER – out of turns</i>	<i>Seat – Fit & Position</i>	16	
	<i>Rear Wheel Hubs</i>	18	
	<i>Height Adjustable Stub Axles</i>	3	
	<i>Adjustable Ackerman</i>	6	
	<i>Adjustable Camber/Caster</i>	8	
<i>Steering – too much bite on turn-in</i>	<i>Tyre Pressures</i>	15	
	<i>Adjustable Brake Balance Bar</i>	19	
	<hr/>		
	BRAKES		
	<i>Brake Pads – excessive clearance</i>	<i>Brake pad adjustment</i>	4
<i>Brake pedal pressure</i>	<i>Pedal pressure adjustment</i>	4	
<hr/>			
ENGINE			
<i>Lacks top end speed</i>	<i>Brake pad adjustment</i>	4	
<i>Lacks mid range</i>	<i>Tyre Pressures</i>	15	
	<i>Adjustable Ackerman</i>	6	



This guide is intended as a general handling and setup guide for all karts, as well as being an owner's manual for the Arrow range of karts manufactured by Drew Price Engineering. For more information on Arrow karts, visit the DPE website at ***www.dpeng.com.au***

Your Arrow karts dealer is: