



## GUIDANCE NOTES FOR THE ARKS TEST AND SYLLABUS



### THE MOTOR SPORTS ASSOCIATION

### ARKS

### AN INTRODUCTION TO KART RACING

The following notes are designed to complement the MSA DVD "Starting Karting" and the MSA Yearbook which are included in your Starter Pack. They are additionally a precis of the basic knowledge required before entering a kart meeting and refer purely to the technique of Trackcraft.

#### **Part 1: PREPARATION**

##### **A RACEWEAR**

In order to compete in karting, a potential kart driver must be equipped with the correct safety wear. This comprises, as a minimum, the following: Crash Helmet, Racing Suit, Boots and Gloves.

Helmets must carry MSA approval and Suits must be CIK homologated, indicated by an embroidered approval number and year code under the collar, or be of leather to a stated minimum thickness. Racewear should be presented in a clean and tidy condition and must be a secure fit. During scrutineering, prior to an event, the driver's race kit will be inspected by an MSA Scrutineer.

##### **B DRIVING POSITION**

Before driving onto the circuit, drivers must concentrate on familiarising themselves with the controls of the kart. The correct seating position is vital if maximum control is to be achieved. The driver must sit in a relatively upright position with hands held on the steering wheel at a quarter to three or ten to two grip. Arms and legs should have a degree of bend and grip on the steering wheel should be relaxed but firm. This 'one grip' technique will be maintained throughout, in preference to the 'feeding the wheel' as favoured for use on the roads. This preferred method allows for a positive but smooth control of the kart.

##### **C MENTAL APPROACH**

The single most important part of a driver's preparation to drive competitively is assuming the correct mental attitude. The driver must perfect the art of focusing his or her concentration before undertaking track driving.

Due to the continuous high speeds involved the driver must learn to maintain this intense level of concentration throughout the time on the circuit. In order to focus 100% on the race track, a driver must clear his or her mind of outside thoughts prior to starting.

## **Part 2: ON THE RACE TRACK**

### **A ENTERING THE RACE TRACK**

Only enter a race track when it is safe to do so. If joining the race track during practice or a race, drivers should look to make sure the circuit is clear, to ensure that they are not driving into the path of a kart already on the track. A kart travelling at slow speed whilst leaving the dummy grid is easier controlled than a kart already on the track traveling at racing speeds. If this kart is forced to take avoiding action, it may result in loss of control. It is normal to raise an arm when joining or leaving the circuit, or when traveling at reduced speed.

### **B THE RACING LINE**

The racing line starts with the approach to a corner and establishing the correct kart positioning. The driver should position the kart on the extreme outside of the circuit on the approach to a corner, running the outside wheels parallel to the white line or grass border as appropriate.

At the braking point for the corner, the driver should smoothly release the accelerator pedal, and apply gentle but increasing pressure onto the brake pedal.

The accelerator and brake pedals must not be used as on-off switches, smooth acceleration and braking will enhance performance. Braking should take place in a straight line, continuing up to the turning-in point.

The driver must arrive at the turn-in point at the optimum corner entry speed. At or just before the turn-in point the driver will look into the bend to find the natural apex or clipping point. At and not before the turn-in point the driver will release the brake, steering lock will be smoothly applied using the 'one grip' method and the kart will coast to this clipping point. The driver will again aim for a high degree of accuracy at the apex, seeking to run their inside wheels brushing against the kerb at this point. Once the apex is reached (and providing the apex is reached) the driver can start to feed the power back on, simultaneously winding off the steering lock. The objective is to make a fast, wide exit from the corner.

The driver should aim to traverse the entire width of the track and full throttle should be re-applied by the exit kerb, together with returning the steering wheel to the straight ahead position. This technique provides the fastest possible corner exit and therefore the highest speed on to the following straight.

In order to pick up the racing line through a given corner, it is essential for a driver to develop the art of looking through that turn, not as most novices practice, looking at it. As speed increases so point of focus should lengthen accordingly.

### **C NOVICE MISTAKES ON RACING LINES**

The driver must resist the natural temptation to turn into a corner too early. The racing line features a late, committed turn-in point. A premature turn-in will inevitably lead to an early apex point and therefore a tendency to run out of road on the exit corner.

Another novice driver error involves entering corners some way above the optimum entry speed. Apart from being potentially hazardous, this leads to a driver having to continue their braking into the corner and thus, by consequence, compromising the driver's exit speed onto the following straight.

## **D DRIVING OFF THE RACING LINE**

Occasionally it will be necessary (or unavoidable) for the driver to run off the regular racing line, for example when overtaking, avoiding a spun/damaged kart or running wide through over-exuberance. The driver must be aware of the physical limitations associated with driving 'off line'.

Grip is reduced by the presence of "marbles" (small balls of rubber thrown on racing tyres, that are normally swept off the correct line). Speeds must be reduced accordingly. The kart will not accept high cornering or braking loadings. This must be considered when setting braking distances and corner entry speeds.

## **E THE OVERTAKING MANOEUVRE**

The driver must respect one main rule in connection with overtaking, namely: "it is the responsibility of the driver making the overtaking manoeuvre to complete it safely, not the responsibility of the kart being overtaken". A driver who is about to be passed should maintain the racing line, the faster driver will move off line to complete the pass.

## **F RUNNING OUT OF TRACK**

In the unfortunate event of a driver and kart leaving the circuit (usually caused by excessive corner entry speed and/or harsh mid corner throttle application), certain recovery techniques need to be employed. As the kart slides outwards, onto the kerb or grass, the driver must resist the natural temptation to 'wrench' the wheel and pull the kart back on line, usually accompanied by snapping off the throttle. Due to the much reduced grip on the outer wheels, either of these over-corrections will very likely lead to the kart spinning out of control.

The correct solution is to minimal control corrections and to gently ease the kart back on to the circuit.

## **Part 3: THE HIGH SPEED TECHNIQUE**

### **A ESTABLISHING A DRIVING RHYTHM**

Before the driver leaves the pits, he or she should have established an objective for that session of driving. The objective in the introductory stages, should not be to set fast lap times. The opening laps of the "Starting Karting" training exercise should be used to warm up and be dedicated to reconfirming the understanding of the racing line. Learning the basics correctly at this stage will pay dividends throughout your racing career.

## **B THE COMPONENTS OF SPEED**

The driver must focus on improving three principal areas of his or her driving, smoothness, accuracy and consistency. These are the component elements of speed. Concentrating on these areas will enable the driver to drive quickly and smoothly throughout. Consciously 'trying' to drive fast will only lead to 'overdriving' and basic errors of technique brought on by the limitations of experience.

## **C UNDERSTEER AND OVERSTEER/CORNERING SLIDES**

Every driver will, at some stage, experience both understeer and oversteer slides.

How swiftly that driver is able to recognise the condition and take the appropriate corrective action determines how quickly that driver will ultimately be able to lap the race track.

### **If the kart understeers - that is a front wheel skid.**

This handling state is generally induced by entering a corner too quickly, with the kart unbalanced with too much steering lock or an excess of power, or indeed a combination of these factors. The characteristic as experienced by the driver is for the front of the kart to try and go straight on. The correction is to reduce the control(s) causing the skid, i.e. take off the power, lock, brakes, etc.

### **Oversteer - that is a rear wheel skid.**

The characteristic here is loss of grip of the rear, and a tendency for the back of the kart to "overtake" the front.

Oversteer should be corrected by the application of corrective opposite lock in the direction of the skid. The throttle should be eased back.

**If the kart is constantly over or under steering it may be necessary to adjust the settings of the kart.**

## **D THE WET WEATHER EXPERIENCE**

Wet conditions present a driver with a considerably increased work load.

To exploit a wet track the driver must be capable of driving with a high degree of finesse. Control applications must be smooth, gentle and progressive. Sudden or sharp control actions should be avoided. Visibility will be much reduced by spray and a 'whirly visor' (working on the principle of a ship's Kent clear view screen) may be a sensible precaution. Alternatively there are a variety of spray applications to help water run off the helmet visor and/or to prevent fogging. A wet track can show a slightly different racing line, dictated by that individual track's idiosyncrasies of drainage. If a layer of rubber has been laid on the circuit, it may create a slippery surface. Therefore it may be necessary to drive off the normal racing line to find grip. As a rule, braking distances must be increased substantially to compensate for the increased possibility of brake lock-up. Cornering speeds will be reduced and the kart's power will have to be applied later and more progressively through the corner. Other traffic should be treated with caution, either when passing or running in close proximity.

A track can often be at it's slippiest just minutes after rain starts to fall, the first shower lifting any recently deposited rubber and possibly oil to the surface creating a sensation not dissimilar to driving over diesel oil on the highway or driving on ice.

Great care should also be taken when a driver is confronted with a wet, but drying track. This can be especially demanding because the dry line offers a relatively high level of grip, however the slightest driver error will result in one or more wheels running onto wet track, thus creating all manner of handling problems. A kart braking too heavily in these conditions will have a tendency to want to continue in a straight line and trying to turn into the corner will usually result in a spin.

Working at and around (but not over) the limit of traction is the key to mastering a wet race track.

## **E SPINNING — A DAMAGE LIMITATION EXERCISE**

If the driver has exceeded the limits of the kart (and/or their personal competence), to the point where corrective action is unable to bring oversteer back under control, then a spin becomes inevitable. This is a disorientating experience but it is essential that the driver works to minimise the consequences. As soon as control is fully lost, the brake should be depressed. Steering should be held lightly, with thumbs positioned outside the wheel. The instant the kart comes to a halt, the driver should raise his arm and cautiously step out of his kart being aware of where the other traffic is and either re-start if possible or move the kart and him or herself to a safe place away from the track, out of the way of potential danger.

## **Part 4: BASIC TRACK DISCIPLINE - PERSONAL AND PRACTICAL**

### **A FLAG SIGNALS**

The driver must be aware that whilst these notes cover the basics of 'physical' track driving techniques, awareness of flag signals is a vital aspect of safe performance driving. Flags are the only means of communication with a driver on the circuit. Failure to notice (and comply with) flag instruction can result in an endorsed licence at best or an accident and potential injury. Drivers must have studied, revised and know the meaning of the various flags (as per the MSA Yearbook), before competing. On the track it is important to know where the flag positions are situated. It is sensible to walk the track in advance of practice and racing to establish the positions of the flag posts.

### **B MECHANICAL FAILURE**

A driver suffering a kart mechanical failure on the track must immediately alert the other drivers of their plight. This can be most effectively done by raising an arm aloft. If the kart is undriveable, or dropping fluids the driver must pull the kart as far off the track as possible. If driveable, the kart can be taken slowly back to the pits, whilst keeping out of the way of other traffic.

## **C      SESSION STOPPAGE**

If a session has to be stopped due to accident and/or track blockage, red flags will be displayed at all marshals posts. Drivers should immediately stop fast lapping, reduce to a slow speed (within a safe distance) and return to the start line without overtaking. Drivers should be prepared (and able) to stop if required, on the track.

## **D      PERSONAL DRIVING DISCIPLINE**

Drivers must act, at all times on the track, in the pits and paddock drive with responsibility and consideration. Driving by 'instinct' alone is not acceptable, drivers must also drive with intellect.

The limits of both kart and track must be approached gradually, the limits of the driver will increase with accumulated experience.

When on the track drivers must resist the temptation to drive out of their 'depth'. Driving beyond personal limits is the raw material of an accident and will at the very least incur the wrath of the motor sport officials and authorities.

Please remember that rules and officials of the circuit are there for your safety and enjoyment and not as some would believe, to spoil your day.

Following the above advice throughout your Karting career will lead to success. Be patient, champions aren't born with a trophy in their hands or made overnight on a production line, but are people who have followed experienced advice.

You have chosen one of the most rewarding sports and may we take this opportunity in wishing you a successful Karting career.