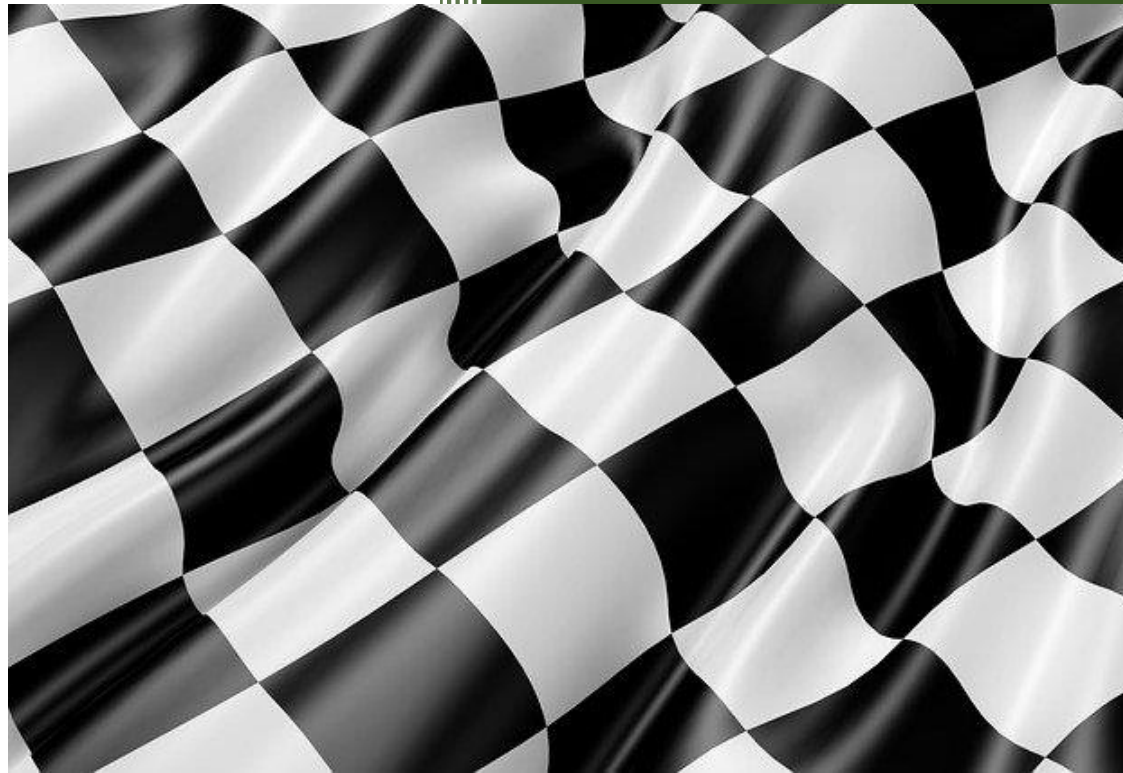




2023

# MSA National Karting Technical Regulations



Version 3

17 March 2023

Ref: 162948

## REVIEW AND AMENDMENTS

Amendments and updates to the rules will be recorded in the Amendment Record, detailing the amendments, date applicable and a short summary of amendments.

### AMENDMENT RECORD

<i>Modified SSR / ART</i>	<i>Date applicable</i>	<i>Date of Publication</i>	<i>Clarifications</i>
<b>ART 17</b>	<b>17.03.2023</b>	<b>17.03.2023</b>	<b>Regulation amendment</b>
ART 10	10.02.2023	10.02.2023	Regulation amendment
ART 16f	10.02.2023	10.02.2023	Regulation amendment
ART 17 Mini Rok Specification Sheet	10.02.2023	10.02.2023	Regulation amendment
ART 19 i and h	10.02.2023	10.02.2023	Regulation amendment
ART 19 OKJ and OK-N Specification Sheet	10.02.2023	10.02.2023	Regulation amendment

### CONTENTS

SECTION A – GENERAL REGULATIONS ALL CLASSES.....	3
1. ADMINISTRATION.....	3
2. FUEL, OIL AND RADIATORS .....	3
3. DEFINITIONS.....	4
4. TYRES.....	4
5. MINIMUM CLASS WEIGHTS PERMITTED.....	5
6. AXLES, RIMS, REAR TRACK.....	5
7. SEATS & SUPPORTS .....	5
8. CHAIN GUARD .....	6
9. PEDALS .....	6
10. MASS.....	6
11. CHASSIS .....	6
12. FUEL TESTING .....	6
13. TITANIUM.....	7
14. BODYWORK – GENERAL .....	7
15. IMPOUNDED PARTS .....	7
SECTION B – KID ROK & MINI ROK .....	7
16. ENGINE .....	7
17. KID ROK & MINI ROK ENGINE SPECIFICATION SHEET .....	8
SECTION D – OKJ & OK-N .....	9

18. TYRES.....	9
19. OKJ & OK-N ENGINES .....	9
19.1 OKJ ENGINE .....	9
19.2 OK-N Engine .....	13
SECTION F – CADET .....	13
20. SPECIFICATIONS .....	13
21. PORT TIMINGS .....	14
SECTION G – KZ2 .....	14
22. TYRES.....	14
23. CHASSIS .....	15
24. FIA KZ2 ENGINE .....	15
25. ENGINES PERMITTED .....	16
26. ENGINE TECHNICAL DESCRIPTION .....	17
27. GENERAL.....	17
28. FUEL – COMBUSTIVE.....	19
29. CONTROLS .....	19
30. CHECKS TO BE DONE BY APPOINTED TECHNICAL CONSULTANT .....	20
31. ENGINES .....	21
32. GEAR SHIFT.....	22
33. REAR AXLES .....	22
34. AIR BOX MODIFICATION.....	22
35. DOCUMENTATION SPEC SHEETS.....	22

## **SECTION A – GENERAL REGULATIONS ALL CLASSES**

### **1. ADMINISTRATION**

- a. Karting is administered under the provisions of the General Competition Rules of Motorsport SA (GCR's), these Standing Supplementary Regulations (SSR's), the class specific Regulations and other regulations and instructions which may from time to time be issued by Motorsport SA (hereinafter referred to as MSA) and the Supplementary Regulations published for each particular kart competition.
- b. These Technical Regulations may generally only be amended for safety reasons or because of force majeure.
- c. It must be noted that MSA Regional and Club Karting regulations may not be in conflict with these MSA National Karting Regulations, unless approval to the contrary has been provided by the Karting Management Group in writing. Where individual Regional and Club Karting regulations are silent on an issue, and in the event of any dispute, these National SSR's will take precedence.

### **2. FUEL, OIL AND RADIATORS**

- a. Where the SR's for an event specify the fuel to be used:

- b. The name of the filling station and pump number will be the only permissible fuel for the event in question.
- c. The organizers have the right to undertake fuel testing by using a FT64 Digitron fuel meter.
- d. Only the specified brand of oil and at the specified ratios may be used and this may not be tampered with in any way.
- e. The national promotor will nominate the oils prior to each SA National Championship event. These will be the only fuel/oils permitted for the event. The fuel/oils so nominated and appearing in the SR's will be used for any fuel/oil changes ordered by the organisers. Also refer to article 4 Fuel Testing.
- f. Apart from the Cadet class, overflow bottles are mandatory for fuel tanks and radiators (if applicable).

### **3. DEFINITIONS**

- a. Chassis – Complete kart as supplied from the registered importer excluding the engine.
- b. Engine – Complete power unit as supplied by the importer including exhaust, carburettor, air box, battery, battery box and wiring harness (as applicable).

### **4. TYRES**

- a. The use of wet weather tyres in qualifying or any of the races will not be permitted unless a wet race or practice is declared by the Clerk of the Course. Likewise, the Clerk of the Course can withdraw authorization for wet weather tyres.
- b. The only tyre allowed are the Levanto tyres.
- c. One (1) set Dry and/or Wet tyres are permitted from the start of Timed Qualifying Practice.
- d. Only tyres issued by the Promoter/Importer will be permitted for the race.
- e. All Drivers must start qualifying practice on new tyres except if it's declared as wet or where the class specific regulations or event SR's permit otherwise.
- f. The organisers must arrange for each competitor's tyres to be marked with his/her racing number and class when exiting the circuit after qualifying, where a barcode scanning system is not in place. The marked (scanned) tyres and/or rims may be impounded by the organisers and re-issued on the day of the race if originally issued prior to race day.
- g. Both dry & wet weather tyres must be identified prior to being used. Checks on identified tyres may be made at any time throughout an event and any competitor found using any tyre, which has not been identified for the event will be excluded from the prior races or qualifying races. Exchanging of tyres between competitors is forbidden and the penalty will be the same as above. The only rain tyre which may be used are Bridgestone's.
- h. It is prohibited to use any chemical treatment, or other means, to artificially enhance the performance of tyres used during official practice or racing. The organisers reserve the right to replace one or more of any competitor's tyres, with a substitute tyre of similar wear, should they believe such action to be warranted. Should a tyre be worn to the extent that it is no longer safe for use, the Clerk of the Course in consultation with the TC may require such a competitor to withdraw from further participation in the event so affected.
- i. The only substance that may be used to inflate tyres is normal air (compressed or otherwise). Race organisers shall have the right to require competitors to deflate their tyres on request and re-inflate them under supervision using normal air. The use of any tyre inflation substance

other than normal air and/or the failure to respond to a request to deflate/re-inflate tyres as above shall be deemed a contravention of the technical regulations and shall be dealt with accordingly.

- j. Tyres may not be deflated after the completion of qualifying or race until the kart has left Parc Ferme. The use of any sort of any artificial heating device to pre-heat tyres, or tyre treatment, including the use of heat guns is strictly forbidden for removal of excess rubber. For the Cadet class, the use of heat guns for removal of excess rubber is allowed. The organizers reserve the right to replace one or more of any competitor's tyres, with a substitute tyre, should they believe such action to be warranted, with the consent and agreement of the Technical Consultant Tyres allowed per class:

Class	Slick	Wet
Cadet	LeVanto KRT MINI	Bridgestone YPW
Kid ROK	LeVanto KRT MINI	Bridgestone YPW
Mini ROK	LeVanto KRT MINI	Bridgestone YPW
OKJ/ OK-N	LeVanto KRT	Bridgestone YNP
KZ2	LeVanto KRT	Bridgestone YNP

#### 5. MINIMUM CLASS WEIGHTS PERMITTED

Cadet	74kg		Kid Rok	100kg
Mini Rok	110kg		OKJ	145kg
KZ2	180kg		OK-N	155kg

#### 6. AXLES, RIMS, REAR TRACK

The rear axle as well as the rims used on the chassis do not have to come from the same manufacturer as the chassis itself. The minimum axle wall thickness applies except where keys are fitted. The maximum diameter of rims shall not exceed 5 inches (126mm). Apart from the KZ class (refer this section), the maximum rear width is measured to the outer-most face of the rims or tyres, whichever is the greater. The following is applicable to the various classes:

Parameter	Cadet	Kid/MiniRok	OKJ/OK-N	KZ2
Axle OD	30mm	30mm MAX	50mm MAX	50mm MAX
Axle wall	N/A	4.9mm MIN	2.0mm MIN	2.0mm MIN
Axle length	N/A	960 ± 10mm	N/A	N/A
Axle mass	N/A	2900 ± 100g	N/A	N/A
Front rim width	11.5cm MAX	11.5cm MAX	13.5cm MAX	
Rear rim width	13.0cm MIN 15.0cm MAX	13.0cm MIN 15.0cm MAX	21.5cm MAX	
Rear track	N/A	1100mm MAX	1400mm MAX	1400mm MAX

#### 7. SEATS & SUPPORTS

The kart seat must be rigidly located on the chassis. It must be so designed so that the driver is securely located to resist movement when cornering or braking. It must be secure, provide the driver with adequate protection and not be cracked or damaged in such a way as to pinch or lacerate or endanger a driver in any way. Seats supports MUST be mounted by using nuts, bolts, and a metal or aluminium washer with a minimum diameter of 40mm and 1,5mm thickness to eliminate break through. The lower seat bolts may be loosened in the event of rain.

All seat supports and stays must be bolted or welded at each end. If they are not used, these seat supports and stays must be removed from the chassis frame and seat.

## 8. CHAIN GUARD

A chain guard is compulsory and must be an effective protection over the top and both sides of the exposed chain and sprocket and extend at least to the lower plane of the rear axle down a line at least level with the centre of both front and rear sprockets. Where engines are fitted with side-mounted carburetors adjoining the front sprocket, a guard must be fitted to prevent the driver's fingers becoming entrapped in the chain.

If a complete chain guard covering the chain and sprockets is used, the chain guard homologated with the engine may be dismantled. In gearbox classes, the chain guard must cover the sprocket and the crown wheel down to the centre of the crown wheel axis.

Cadet competitors may use the chain guard and supports provided by the OEM, but it is recommended that the cover be lowered to fully cover the sides of the top of the chain.

## 9. PEDALS

With the exception of the Cadet class, the brake pedal MUST have a double linkage to the master cylinder. The accelerator pedal MUST be equipped with a return spring, and pedal extenders and footrest are allowed.

## 10. MASS

~~The mass shall be deemed as being the minimum at all times,~~ The mass shall mean, the minimum mass permitted at all times, including during qualifying, and will include the mass of the driver equipped for racing with helmet, visor or goggles, shoes, gloves and protective clothing. Any ballast carried in order to meet the minimum mass prescribed must be firmly fixed to the satisfaction of the scrutineers only to the chassis or seat. For any ballast weight of up to 2kg, attachment must be by a minimum of one bolt with a minimum size of M6 or permanent fixings, with an additional bolt or fixing for every 4kg or part thereof. Cable ties are NOT allowed.

## 11. CHASSIS

**The only chassis permitted are as per MSA Karting Sporting Regulations. Chassis is to be raced as supplied by the OEM.**

For the Cadet class, only the Top Kart Kid Kart and Blue Boy chassis is eligible. It is to be raced as supplied without expensive accessories or replacement parts. Older models are acceptable subject to the current plastic rear bumper being fitted. A generic aluminum engine mount may be used in place of the weld-on metal version. A metal plate maximum 3mm thick may be fitted to aid engine alignment. Top Kart camber washers may be used to adjust caster/camber.

## 12. FUEL TESTING

- a. The following test method will apply to all karting events and classes as approved by MSA for Club, Regional and National events.
- b. The test instrument will be the Digatron FT64 which must be clearly identified by a serial number or identifying mark and will be the only instrument of the day to be used. Only MSA approved Fuel TC's may perform fuel testing.
- c. The only calibration on the instrument of the day will be the reading from the mixed reference sample fuel that is kept by the fuel TC.
- d. A clearly marked reference sample of every mix ratio (fuel: oil) will be kept by the fuel TC or COC.
- e. The difference in reading between the reference sample that is applicable for each class and competitor fuel reading may not be more or less than 2. This value may be changed by the Fuel TC of the event before qualifying. Fuel testing can be done at any time during the event.

- f. The temperature difference may not be more than 2 degrees Fahrenheit. If the temperature is not within the limits, the fuel tank of the competitor must be impounded and sealed, the competitors fuel temperature will be allowed to equalize to the reference sample and a new reading obtained no later than 30 minutes before publication of final results.
- g. The minimum amount of fuel in the tank at any time may not be less than 300ml. The fuel may be decanted into a suitable container for the necessary testing to be done.
- h. It is the responsibility of the competitor to be present at all times when readings of the fuel are done and to check with the fuel TC that the fuel used by competitor is within the set parameters.
- i. The COC or Fuel TC may at any time have competitors fuel replaced with organisers fuel.
- j. A penalty of exclusion will apply for any infringements of the above and is not protestable, and repeat offenders will have their race licence revoked.

### **13. TITANIUM**

The use of titanium for any part of a kart is forbidden.

### **14. BODYWORK – GENERAL**

- a. Nose cones may NOT have additional fastenings or securing for example, plastic zip ties, other than as stated below. In the interest of safety, it is permitted to secure the nose cone clamps with a single loose cable tie as pictured below to the upper bumper bar.



- b. In the event of loss of the front fairing (nose cone) during a race, the competitor must pit within (2) laps to have the fairing replaced. Failure to do so will result in the exclusion

### **15. IMPOUNDED PARTS**

- a. From qualifying each driver will be allowed to use a maximum of two sealed engines. Should a competitor subsequently wish to change or repair an engine or component thereof, which will necessitate the breaking of a seal or removing any identification, this may only be done under the supervision of the Scrutineers. Once the change of engine or component is complete, the engine or component will again be sealed or identified. The changed component or engine must be impounded by the Scrutineers
- b. When a competitor elects to use his/her second engine during competition the first engine used must be handed in at Parc Ferme to the Technical Consultant/Scrutineer prior to the start of the competitor's next race.

**Note: Engines handed in to the Technical Consultant/Scrutineer will be subject to technical checks.**

## **SECTION B – KID ROK & MINI ROK**

### **16. ENGINE**

- a. The only engines permitted is as per the homologated engines listed in the National Karting Sporting Regulations.
- b. All engines must be sealed by the Engine Builder, Technical Consultant and/or Scrutineer. It is the responsibility of the competitor to ensure that the Engine Builder, Technical

Consultant/Scrutineer has sealed his/her engine/s before taking part in qualifying/races. ALL competitors need to ensure that the cylinder head and cylinder have cross-drilled nuts/bolts to facilitate the fitting of wire seals. Seals need to have a barcode and number.

- c. No type or form of modifications is allowed to the engine or any other parts except those detailed in the engine specification sheet. This includes fuel supply, carburettor, ignition, etc.
- d. No break allowed in fuel line between tank to fuel pump except for the fitting of a fuel filter.
- e. A fuel return pipe may be fitted on the pump side of the fuel line between the pump and the carburettor fuel inlet.
- f. The following fuel return specification will apply only to Kid Rok:

<b>Kid Rok fuel line return specifications – To be used as supplied by Derrick Irving Racing</b>	
Fuel line, carb to bottom of T-piece	4.8mm ID. Length less than 50mm.
Fuel line T-piece side to fuel pump supply	4.8mm ID. Length 310mm ± 20 mm. ID Needs to be marked on pipe.
Fuel line T-piece to return filter	6mm ID. Length 800mm ± 50 mm. ID Needs to be marked on pipe.
Fuel line return to fuel tank	6mm ID. Length 450mm ± 50mm. ID Needs to be marked on pipe.
T-piece	6mm Festo blue/brass.
Fuel filter - OMG. Re-usable with spec jet	<del>Dellorto main jet drilled to 2mm maximum.</del> Return jet is optional.

- g. No exhaust or cylinder temperature measuring devices or lambda sensors are allowed to be used during qualifying/races. To clarify, these devices and/or sensor must be completely removed and the exhaust must be used as supplied by the engine importer.
- h. Competitors must ensure that clutches and clutch drums are free from oil, grease or any other lubricants.
- i. Refer to the relevant engine and carburettor specification sheets for technical specifications and carburation, which can be found on the MSA website [www.motorsport.co.za](http://www.motorsport.co.za)
- j. The wiring harness is free of restriction.
- k. The engine kill switch is not mandatory.

#### 17. KID ROK & MINI ROK ENGINE SPECIFICATION SHEET

Item	Kid ROK	Mini ROK
Spark plug cap	W420/2 (ROK) or TB05EM (NGK)	W420/2 (ROK) or TB05EM (NGK)
Spark plug	NGK B9EG or B10EG	NGK B10EG
Squish	2.65mm Min measured with 3.15mm resin core solder	0.8mm Min measured with 1.6 mm resin core solder
Cylinder head shape and volume	9.6 cc Min, and ROK profile gauge	6.8 cc Min, and ROK profile gauge
Head Spacer Thickness	2.0mm ± 0.1	As required to achieve volume
Head Spacer OD	62.1mm +/- 0.1	NA



Head Spacer ID	41.7mm +/- 0.1	NA
Shims	As required	As required
Port durations (measured with 5mm wide ROK feeler gauge)	Exhaust 154° Max Transfer 116° ± 1.5° Inlet 143° ± 1.5° Overlap 31° Min	Exhaust 154° Max Transfer 116° ± 1.5° Inlet 143° ± 1.5° Overlap 31° Min
Ignition timing	Free	Free
Exhaust manifold	As per Mini ROK specification with a 16mm exhaust restrictor. NO GO specification: 16.10mm. Exhaust manifold needs to be sealed to the engine.	As per Mini ROK specification
Carburettor	Dellorto PHBG 18BS	Dellorto PHBG 18BS
Main jet	Free	Free
Emulsion tube	Dellorto AN266	Dellorto AN266
Needle	Dellorto W23	Dellorto W23
Needle clip position	Free	Free
Needle and seat	As per current Mini ROK carburettor specification	As per current Mini ROK carburettor specification
Choke jet	Dellorto 60	Dellorto 60
Pilot jet (idle jet)	Dellorto 50	Dellorto 50
Slide	Dellorto 40	Dellorto 40
Floats	Dellorto 4.0 grams	Dellorto 4.0 grams
Sprockets rear	Free	Free
Engine sprocket	T10 with Vortex Logo	T10 or T11 with Vortex Logo
All other specifications	As per current Mini ROK FIA homologation form	As per current Mini ROK FIA homologation form

## SECTION D – OKJ & OK-N

### 18. TYRES

- a. One set of new Slick tyres to be used from timed qualifying practice until the last and final race of the competition.
- b. In the case of the race being declared a wet race the competitor is entitled to used 1 set of Wet tyres that has been scanned by the Organizers. Tyres may be used or new.

### 19. OKJ & OK-N ENGINES

#### 19.1 OKJ ENGINE

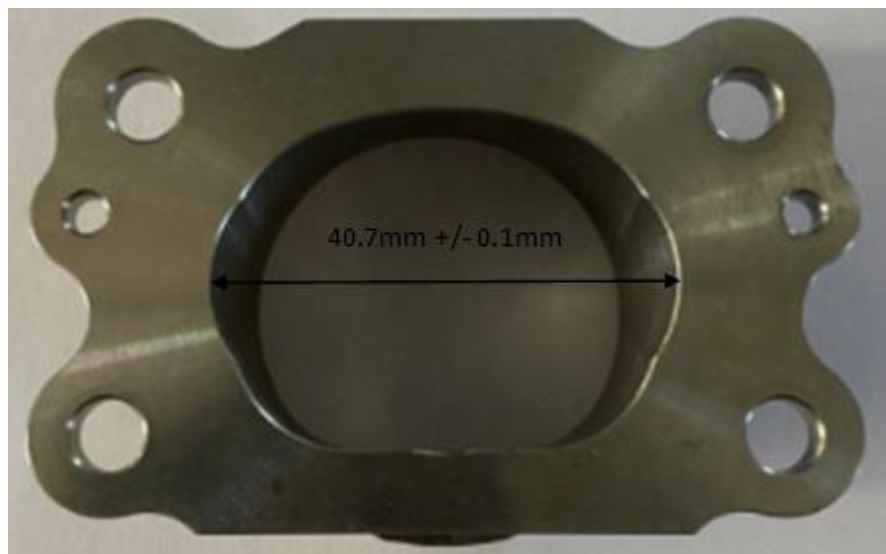
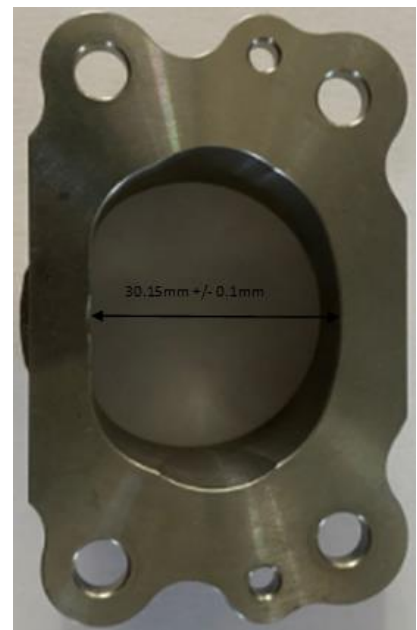
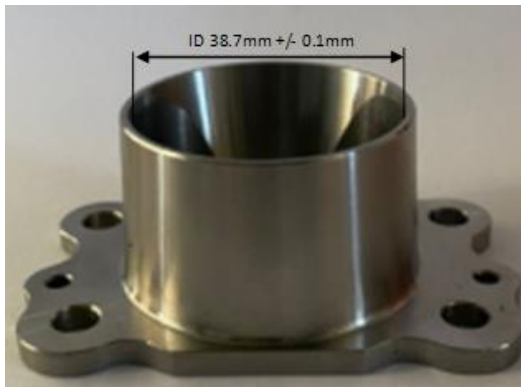
- a. A pool engine system will be put in place for National Championship events. Pool engines are non protestable at National Championship events. Competitors not satisfied with their engine may request a different engine in consultation with the TC, designated engine supplier and Clerk of Course. This request may only be made once per racing season. A bulletin will be issued on costs of engine rentals.
- b. When engines are swapped, this will include engine, exhaust, carburetor, air box and throttle inner cable.

- c. For National competitions the only engine permitted will be as supplied from MSA's approved OKJ engine service provider as from official practice that is pre-sealed by the engine service provider.
- d. No type or form of modifications/adjustments is allowed to the engine or any other parts which include the fuel supply, carburetor, ignition etc.
- e. No break is allowed in the fuel line between the tank to the fuel pump and pump to the carburetor other than for the fitting of a fuel filter.
- f. No exhaust or cylinder temperature measuring devices are allowed to be used during competition. A water temperature sensor is compulsory during National/Regional competitions.
- g. During National Championship events, competitors may be requested to swap engines from start of official practice. Competitors will generally use a minimum of two pool engines during a race weekend. It must be noted that the amount of engine swaps/changes for an event is not limited to two and might be more at sole discretion of the controllers. The order in which the engine swap/s takes place will be completely random and is determined and published before start of timed practice.
- h. Inlet Manifold: The only inlet manifold permitted is as per photos below. No material may be added or removed.





- i. Exhaust Manifold: The only exhaust manifold permitted is as per photos and dimensions below. No material may be added or removed. The Exhaust Manifold gasket as supplied must be fitted at all times.



Item	OKJ	OK-N
Airbox	KG Nitro airbox.	KG Nitro airbox.
Spark plug cap	W420/2 (ROK) or TB05EM (NGK)	W420/2 (ROK)
Spark plugs	NGK B9EG or NGK B10EG	NGK B9EG or NGK B10EG
Squish	0.85mm Min measured with 1.6mm resin core solder	<del>0.85</del> 0.68 mm Min measured with 1.6mm resin core solder
Cc's cylinder head only	14.0cc Min	<del>14</del> 12.0cc Min
Head gasket	As required	As required
Shims	As required	As required
Exhaust port duration	171° Max measured with 5mm wide ROK feeler gauge	194° Max measured with 5mm wide ROK feeler gauge
All ports and passages	All ports and passages have a cast surface finish. The only exception allowed will be the removal (by the manufacturer) of aluminium cast burr/s at the inlet, exhaust and transfer ports and passages next to the cast iron sleeve to a maximum depth of 15mm. It must be noted that any additional machining not provided for above is strictly prohibited	All ports and passages have a cast surface finish. The only exception allowed will be the removal (by the manufacturer) of aluminium cast burr/s at the inlet, exhaust and transfer ports and passages next to the cast iron sleeve to a maximum depth of 15mm. It must be noted that any additional machining not provided for above is strictly prohibited
Inlet system	As per FIA Karting Specification	As per FIA Karting Specification
Ignition timing	Free	Free
Ram Tubes for airbox	Must have 2 and have a maximum internal diameter of 23mm	Must have 2 and have a maximum internal diameter of 23mm
Max RPM	14000	15000
Exhaust manifold	As per FIA Karting Specification	As per FIA Karting Specification
Carburettor	Dellorto VHST24BS	Tillotson HW-49A
Main jet holder	Dellorto 18.0 ± 0.1	N/A
Emulsion tube	Dellorto AQ270 - 2.70mm ± 0.2	N/A
Needle	Dellorto D55	N/A
Needle clip posit.	Free	N/A
Needle and seat	Dellorto 270. NO GO 2.71mm	Pressure adjustable. As per FIA Karting homologation form.
Choke jet	Dellorto 60 - GO 0.60mm / NO GO 0.62mm	N/A
Pilot jet (idle jet)	Dellorto U43. Through holes GO 0.42mm / NO GO 0.44mm. Jet size GO 0.98mm / NO GO 1.01mm	N/A
Slide	Dellorto 50	N/A
Floats	Dellorto 4.0 grams	N/A

Sprockets rear	Free	Free
Engine sprocket	T12	T12
All other specifications	As per FIA Karting Homologation Form	As per FIA Karting Homologation Form

## 19.2 OK-N Engine

- a. For all competitions competitors will use a FIA Karting specified VTS-N VORTEX engine which must be sealed by the Engine Builder, Technical Consultant and/or Scrutineer. ALL competitors need to ensure that the cylinder head and cylinder have cross-drilled nuts/bolts to facilitate the fitting of wire seals. Seals need to have a barcode and number.

**Note: It is the responsibility of the competitor to ensure that the Engine Builder, Technical Consultant/Scrutineer has sealed his/her engine/s before taking part in qualifying/race/s.**

- b. No type or form of modifications/adjustments are allowed to the engine or any other parts except those detailed in the engine specification sheet. This includes the fuel supply, carburettor, ignition, etc.
- c. No break allowed in fuel line between tank to fuel pump and pump to carburettor other than for the fitting of a fuel filter.
- d. No exhaust or cylinder temperature measuring devices or lambda sensors are allowed to be used during qualifying/races. To clarify, these devices and/or sensor must be completely removed and the exhaust must be used as supplied by the engine importer.

## SECTION F – CADET

### 20. SPECIFICATIONS

- a. The Top-Kart Comer C50 and CX52 according to these regulations is the only permitted kart.
- b. Engine must comply with the Bambino Comer C50 and CX52 Engine Specification Technical Sheet published on MSA's website.
- c. Only the Top Kart Kid Kart and Blue Kid Chassis in SARMC rules is eligible
- d. It is to be raced as supplied without expensive accessories or replacement parts.
- e. Older models are acceptable subject to the current plastic rear bumper being fitted.
- f. A generic aluminum engine mount may be used in place of the weld-on metal version.
- g. A metal plate maximum 3mm thick may be fitted to aid engine alignment.
- h. A rev-counter / lap timer is permitted. No additional sensors (CHT, throttle position etc) are allowed during the event.
- i. Top Kart camber washers may be used to adjust caster/camber.
- j. Maximum rear width measured from the outside of the rim/tyre shall not exceed 1075 mm.
- k. Side pods must be flush or wider than the outside face of the rear wheels.
- l. The rear bumper if adjustable must be as wide as or greater than the width of the rear wheels.
- m. Original Top Kart or EMR Cadet rear axles are the only axles permitted.

- n. No modifications are permitted, and any variations must be approved **in writing** by the MSA Karting Management Group prior to the modification being made.

## 21. PORT TIMINGS

Port timing measurements will be done with either a digital degree wheel or a graduated disc of 280mm Min diameter and a pointer that is sharpened to a knife edge. To avoid arguments over parallax errors the pointer should be less than 3mm from face of the degree wheel where the reading is taken. The sharp point must clearly be on the line defining the maximum measurement. The measurement will be taken with all the slack in the system taken up i.e. the crankshaft will be rotated until it firmly stops against the feeler gauge. The feeler gauge will be 0.2mm thick and 8.0mm wide. The feeler gauge will follow the angle on top of the piston for exhaust port measurement and be held flat on the bottom of the inlet port.

Item	C50	C52
Spark plugs	Champion RCJ7Y or NGK BPMR7A or Bosch WS5F.	Champion RCJ7Y or NGK BPMR7A or Bosch WS5F.
Combustion Chamber Min Volume	6.9cc (without insert) 7.2 (with insert)	6.4cc (without insert) 6.7cc (with insert)
Inlet port duration	128° Max	125° Max
Exhaust port duration	138° Max	150° Max
Front Sprocket	Z10	Z10
Rear Sprocket	Z76	Z74
Inlet system		
Ignition timing	Max 3.8mm BTDC	As per MSA Technical Fiche
Exhaust manifold	As per MSA Technical Fiche	As per MSA Technical Fiche
Carburettor	As per MSA Technical Fiche	As per MSA Technical Fiche
All other specifications	As per MSA Technical Fiche	As per MSA Technical Fiche

## SECTION G – KZ2

### 22. TYRES

#### Supply and Fitting:

- New tyres can be purchased and fitted to rims on the Friday of the race weekend but must be scanned.
- New tyres maybe utilised for each SA National and Regional for Qualifying and race day heats for these events.

#### KZ2 Shifter Class:

- LeVanto KRT dry (one new set per race day).
- Bridgestone YNP wet (only one set allowed for the days racing).

#### Tyre monitoring:

Each barcoded set of tyres will be scanned and allocated to each competitor to ensure that the

same set is used for the Official Qualifying and all three races on the day.

Tyres may be rotated on the rims between races.

### **23. CHASSIS**

The chassis must comply with the following regulations:

- a. Rear protection, bodyworks, front panel and spoiler – FIA Karting homologated only.
- b. Rear and front homologated brakes of the same type acting on both front and rear wheels KZ type foot.
- c. Two or three rear axle ball bearings to be operational at all times (no ceramic type ball bearings permitted).
- d. Ceramic type disc rotors will no longer be allowed from 2015 as per FIA Karting FIA ruling.
- e. One chassis per driver.
- f. Any chassis damaged during an ascertained accident will be reported to the technical consultant/ scrutineer who will consult with the relevant officials in deciding if the chassis warrants replacement or not. Only they may authorise the replacement.
- g. Any decision to allow the use of an alternative chassis will render the use of the original chassis void.
- h. Chassis must also comply with: Conventional chassis, under FIA Karting current homologation.
- i. Hollow magnetic steel rear axle, maximum diameter 50mm.
- j. The regulations prescribed by FIA Karting (Group 2) are strictly applicable for any detail not mentioned in the paragraph concerning the CHASSIS (as per article 2 of the present regulations). Only chassis homologated for use in S.A. may be used.

### **24. FIA KZ2 ENGINE**

#### **Specific Regulations for KZ2**

- a. Water cooled single-cylinder engine with reed-valve intake homologated by the FIA Karting.
- b. Maximum cylinder cubic capacity: 125cc.
- c. Reed-valve box (dimensions and drawing) according to the Homologation Form. Reed-valve box cover is free.
- d. Float chamber carburettor made of aluminium, with a venturi type diffuser with a maximum diameter of 30mm.
- e. The carburettor must remain strictly original. The only settings allowed may be made to: the slide, the needle, the floaters, the float chamber, the needle shaft (spray), the jets and the needle kit, subject to all the interchanged parts being of Dell'Orto origin. The incorporated petrol filter and the plate (part No. 28 on the technical drawing No. 7 appended) may be removed, but if they are kept, they must be original.
- f. Gearbox: homologated by the FIA Karting (including the primary torque). With a minimum of 3 ratios and a maximum 6 ratios allowed. Check of the ratios using a graduated disc with a minimum diameter of 200mm or a digital coder; the degree decimals given on the Homologation Form must be mentioned in tenths of degrees and not in minutes. For the homologation of the gearbox, the Manufacturer(s) and the model and type must appear on the Homologation Form.

- g. In KZ2, a hand-operated and exclusively mechanical gearbox control without a servo system must be used. Any system of ignition cutting is forbidden.
- h. Total exhaust opening angle of 199° maximum, irrespective of the value indicated on the homologation form (to be read with a graduated circle of a minimum diameter of 200mm or with a digital device).
- i. Volume of the combustion chamber is 11cc minimum, measured in accordance with the method described in Appendix No. 1a.
- j. Spark plug is a free make (mass-produced and strictly original). The body of the spark plug (electrodes not included), tightened on the cylinder head and must not extend beyond the upper part of the dome of the combustion chamber.
- k. Dimensions of the threaded spark-plug housing: length 18.5 mm; pitch: M 14 x 1.25.
- l. Identifications: Machined flat spaces of 30mm x 20mm for the attachment of the specified identification stickers at two locations viz. the front of the cylinder, and the upper part of the reed box housing for the half sumps.
- m. It is allowed to add a mass to the ignition rotor; it shall be fixed by at least 2 screws, without any modification to the homologated rotor.
- n. Exhaust: Homologated and the magnetic steel sheet metal thickness of which must be 0.75mm minimum.
- o. Exhaust silencer: Homologated, and mandatory for use. Fitting of the exhaust and silencer according to the Technical Drawing No. 20.

## **25. ENGINES PERMITTED**

TM KZ10 Homologation Form No. 49/M/18 VERSION 1.3 – 13/12/2012

TM KZ10C Homologation Form No. 32/M/24 VERSION 1.2 – 22/09/2016

TM KZ-R1 Homologation Form No. 041-EZ-75 VERSION – 09/2020

VORTEX RSZ Homologation Form No. 012-EZ-76 VERSION 1 - 15/02/2019

- a. All models to be raced complete with carburettor, exhaust and ignition as supplied by the manufacturer and specified on the motor's homologation form and must comply with the FIA Karting Technical Regulations for KZ2 Engine Specifications.
- b. Only original TM components may be used as per TM spare parts lists of each Homologated TM engine.
- c. Only original Vortex components may be used as per the Vortex spare parts list of the Homologated Vortex engine.
- d. No modifications of these engines or any components including the exhaust and carburettor are permitted unless specifically noted. Any modification or adjunction on these engines and its accessories, if not expressly authorized in these regulations, is forbidden. Drivers are responsible for the conformity of their equipment.
- e. All engines will be sealed after qualifying and will remain sealed for the entire race day. The seal is to be secured between the cylinder head bolt and the reed cover manifold and to be made as tight as possible. Should there be a technical reason for breaking the seal, the kart must be taken to Parc Ferme and in consultation with the Scrutineer carry out the breaking



of the seal and necessary repair. The engine will then be resealed. Failure to follow procedure will result in a DQ on race day.

- f. Should a motor be replaced then the damaged motor is to remain in the care of the Scrutineers until they say it may be handed back.

**Please note that the FIA homologation sheets and homologated parts catalogue been used for the engine rules are available on the MSA website. The full FIA Karting regulations can be found on: <https://www.fiakarting.com/>**

## 26. ENGINE TECHNICAL DESCRIPTION

### a. Cylinder cubic capacity

V is the volume engendered in the engine cylinder(s) by the upward or downward movement of the piston(s). This volume is expressed in cubic centimetres and, for all calculations concerning engine capacity, the number “pi” will be taken inclusively as 3.1416.

$$V = 0.7854 \times d^2 \times l \times n \quad \text{with: } d = \text{bore; } l = \text{stroke; } n = \text{number of cylinders.}$$

### b. Ducts or passages

Ducts or passages are cylindrical or cylindrical-conical elements allowing the passage of gases whatever the length or position of these elements. The number of ducts or passages is the greatest quantity of cylindrical or cylindrical-conical elements which transmit gases from the pump casing to the top of the piston, as well as those which transmit gases from the outside of the cylinder to the inlet ports, or from the exhaust ports to the outside of the cylinder.

### c. Inlet or exhaust port

A port is composed of the intersection of the periphery of the cylinder and the inlet or exhaust duct. This port is opened or shut by the passage of the piston.

### d. Power valve

By « power valve » is meant any system which can alter by manual, electric, hydraulic or any other means the normal exhaust port timing or the normal flow of exhaust gases at any point between the piston and the final exhaust exit when the engine is running.

## 27. GENERAL

By engine is meant the propelling unit of the vehicle in running order, including a cylinder block, sump and gearbox, ignition system, carburettor(s) and exhaust silencer.

All systems of injection are forbidden. The spraying of products other than fuel is forbidden. The engine shall not comprise a compressor or any super-charging system.

Any modifications inside the engine may only be carried out by the removal of material. KZ2 engines must be described in the Manufacturer's catalogue and be the subject of a descriptive form called "Homologation Form" from the model established by the FIA Karting.

### a. Cylinders

For UN sleeved engines, repairing cylinders is allowed by addition of material but not of parts.

Cylinder head: it is allowed to replace the spark plug thread by a heli-coil, must remain within factory specs.

### b. Water cooling

Only water (H<sub>2</sub>O) is authorised for liquid cooling. No glycol based antifreeze is allowed to be used.

For all categories using water cooling, radiators must be placed above the chassis frame, at a

maximum height of 50cm from the ground, at a maximum distance of 55cm ahead of the rear wheels axle and they must not interfere with the seat. All the tubing must be of a material designed to withstand the heat (150°C) and pressure (10bar). To control the temperature, it is only allowed to place at the front or at the rear of the radiator a system of masks. This device may be mobile (adjustable), but it must not be detachable when the kart is in motion, and it must not comprise dangerous elements. Mechanical by-pass (thermostat type) systems, including by-pass lines, are allowed. In line heat exchangers are allowed in the water pipes.

**c. Water pump**

The water pump must be mechanically controlled either by the engine or by the rear axle.

**d. Carburettors and inlet duct**

Any injection system is forbidden. Any spraying of products other than fuel is forbidden. The inlet duct (mechanical assembly between the homologated inlet silencer and the reed box) must comprise the inlet silencer, the carburettor and the reed box cover, as well as a possible adaptor, spacer and/or gaskets. No additional component is authorised.

The adaptor (spacer) must have a transversal conical cylinder cross-section, be mechanically attached with tools and present neither any connections fitting together nor parts which overlap each other. Furthermore, it is forbidden to have any connection resulting in an extra volume (including any groove, hollow space or other such spaces) at the level of the inlet duct. Carburettors in the KZ2 category for the FIA Karting Championships in 2019/2020/2021: technical drawing No. 7 appended. Inline heat exchangers and carburettor tanks are permitted in the fuel line.

**e. Ignition**

In all categories the ignition system used must be homologated by the FIA Karting. For the KZ2 the ignition system used must be (as per the engines Homologation Form) of analogue type and any variable ignition system (system of progressive advance and delay) is forbidden.

Any electronic system allowing an auto-control of the parameters of functioning of the engine while the kart is in motion is forbidden.

Competitors in consultation with the TC and Clerk of the Course must request to interchange Entrants' ignition systems for the system supplied by the FIA Karting or the ASN concerned (same homologated models).

**f. Spark plug**

The ignition spark plug must be mass-produced and remain strictly original. The spark plug barrel and the electrode insulation (electrodes not included) tightened on the cylinder head must not extend beyond the upper part of the combustion chamber dome (see Appendix No. 7).

The spark plug must be installed with its gasket.

A spark plug temperature probe is permitted and if it is min 1.2mm thick, after being fitted and/or used it can act as a spark plug gasket. The insulator must not exceed the spark plug body and the length of the spark plug body itself must be a max 18.5mm

**g. Inlet Silencer (Air Box)**

An inlet silencer homologated by the FIA Karting is mandatory.

KZ2: ducts of 30mm maximum.

Variable volume air boxes are forbidden.

The obligatory homologated intake silencer must be used under strict observance of the following points:

If the rubber bush is reversible, it may only be cut on one side, the unused one located in the body of the silencer.

The part of the bush linking the silencer to the carburettor must be visible at all times and must be on the outside of the silencer. It allows the rear face of the silencer to be connected to the cylindrical shoulder of the carburettor.

**h. Exhaust**

In KZ2 the exhaust must be Engine Specifically homologated. In all categories the exhaust system shall discharge behind the Driver and shall not operate at a height of more than 45cm from the ground. The exhaust silencer outlet, the external diameter of which must be more than 3cm, must not exceed the limits of the body or bumper. All systems of « power valve » are forbidden.

Competitors in consultation with the TC and Clerk of Course may be authorised to interchange Entrants' exhaust systems for the system supplied by the FIA Karting or the ASN concerned (same homologated models).

**i. Silencer**

The Exhaust Silencer must be FIA Homologated. See FIA Exhaust Silencer Homologation List.

**28. FUEL – COMBUSTIVE**

**a. Fuel**

The requirements specified in these regulations are intended to ensure the use of fuels predominantly composed of compounds normally found in commercial fuel, and to prohibit the use of specific power-boosting chemical compounds. All competitors will only be permitted to use freely and commercially available 95 octane pump fuel.

**b. Mixture used in 2-stroke engines**

The KZ2 class will use oil as prescribed by the National Promoters in the event SR's. Modification of the basic fuel composition by the addition of any compound is strictly forbidden. This restriction also applies to the lubricant, which must not change the composition of the fuel fraction when added to the fuel. Furthermore, as for the fuel, the lubricant must not contain any nitro-compounds, peroxides or any other engine power boosting additives. Fuel testing will be the norm in the Nationals and a base needs to be set.

**c. Air**

Only ambient air may be mixed with the fuel as a combustive.

**29. CONTROLS**

**For control, the following tolerances are allowed**

Connecting rod centre line:  $\pm 0.2\text{mm}$

Piston stroke:  $\pm 0.2\text{mm}$

Crankshaft alone:  $\pm 0.1\text{mm}$

Homologated gearbox: Value obtained after 3 engine rotations:  $\pm 3^\circ$

Exhausts of all 125cc engines:  $\pm 1\text{mm}$

**Piston, crankshaft & conrod, reed box, balance shaft**

Dimensions: <25mm - Tolerance:  $\pm 0.5\text{ mm}$

Dimensions: 25-60mm - Tolerance:  $\pm 0.8\text{mm}$

Dimensions: 60-100mm - Tolerance:  $\pm 1\text{mm}$

Dimensions: >100mm - Tolerance:  $\pm 1.5\text{mm}$

## **Other parts**

### **Machined Parts:**

Dimensions: <25mm - Tolerance:  $\pm 0.5\text{mm}$

Dimensions: 25-60mm - Tolerance:  $\pm 0.8\text{mm}$

Dimensions: >60mm - Tolerance:  $\pm 1.5\text{mm}$

### **Welded parts**

Dimensions: <25mm - Tolerance:  $\pm 1.0\text{mm}$

Dimensions: 25-60mm - Tolerance:  $\pm 1.5\text{mm}$

Dimensions: >60mm - Tolerance:  $\pm 3.0\text{mm}$

The units of measure (including derived units) will be those of the international system: unit of length in metres, unit of mass in kg, unit of time in s, and unit of noise level in decibels. However, the following will be used: for the unit of angle, the  $^{\circ}$  (degree) instead of the radian; and, for the unit of temperature, the  $^{\circ}\text{C}$  instead of the Kelvin.

### **Without tolerance, at all times and whatever the conditions may be**

Cubic capacities.

Diameter of the carburettor venturi. (30.0mm Max).

Mass measurement.

Combustion chamber volume. (11cc Min)

Any minimum and maximum value.

## **30. CHECKS TO BE DONE BY APPOINTED TECHNICAL CONSULTANT**

### **a. Method for measuring the opening angles of the exhaust ports**

All motors: Exhaust 199 degrees Max. In order to make the measurement more accurate, a 0.20mm thick x 5mm wide wedge (according to technical drawing No. 18) will be used to establish the start and finish of the measurement. This wedge will be gripped at the chord axis of each port, between the edge of the upper part of the piston ring or of the piston and its intersection with the edge of the inlet or exhaust port. The position by which the gripping of the wedge will permit the measurement of the largest possible angle will be considered as the beginning and the end of the measurement of the angle.

This wedge may be set in position through the inside of the cylinder or through the duct of the exhaust port to be checked. It will not be mandatory on any account for the wedge to be placed in a horizontal or vertical position. The reading will be carried out using a graduated disc with a minimum diameter of 200mm or a digital display measuring device operated by a coder.

### **b. Volume test for combustion chamber**

[Appendix No. 1](#) On KZ2 Engines, the volume then measured minus the plug insert (2cc) must not be less than 11cc using the plug insert as per [Drawing no. 6](#).

### **c. General method for measuring the volume of the combustion chamber**

Remove the engine from the chassis. Wait until the engine is at ambient temperature. Have the cylinder head removed to check the protrusion of the spark plug. Have the spark plug removed (check the 18.5mm dimension). Screw the plug insert in place of the spark plug (the plug insert, tightened on the cylinder head, must not extend beyond the upper part of the dome of the combustion chamber. It must be fixed to the cylinder in exactly the same way as the spark plug measuring 18.5mm long).

Make the top part of the piston and the periphery of the cylinder waterproof using grease. Place the piston at top dead centre and block the crankshaft. Carefully remove the excess grease. Place the cylinder head back and screw it in at the torque recommended by the

Manufacturer.

With a laboratory graduated burette (mechanical or electronic), fill the combustion chamber (with DEXTRON VI type oil) to the uppermost part of the top edge of the plug insert (wetting the plane of the head gasket).

**d. Alternative method for measuring the volume of the combustion chamber**

Remove the engine from the chassis. Wait until the engine is at ambient temperature. Have the spark plug removed (check the 18.5mm dimension). Screw in the plug insert in place of the spark plug (the plug insert, tightened on the cylinder head, must not extend beyond the upper part of the dome of the combustion chamber. It must be fixed to the cylinder in exactly the same way as the spark plug measuring 18.5mm long). Place the piston at top dead centre and block the crankshaft. With a laboratory graduated burette (mechanical or electronic), fill the combustion chamber (with DEXTRON VI type oil) to the uppermost part of the top edge of the plug insert (wetting the plane of the head gasket). In case of discrepancy of the measured value, the complete procedure must be carried out according to the "General Method" of [Appendix No. 1](#).

**e. Squish test and procedure**

This can be used as an alternative for volume test on race day between races. A minimum squish of 1mm is permitted and measurement will be done with a digital Vernier at the smallest point of the wire up against the shoulder created by the piston. The Vernier will be owned by the club and will be present on race days for any competitor to check squish prior to the sealing of the motor. The solder wire to be 1.6mm Solid Wire. The solder wire will have a tolerance off  $\pm 0.1$ mm. The squish will be checked on both the left and the right side of the piston parallel to the gudgeon pin, and the smaller of the two measurements will be the measurement used for legality.

Remove the spark plug. Insert solder to touch cylinder wall directly above the gudgeon pin. With the solder wire in place the motor will be turned through top dead centre once. The step on the solder will not be cut off. The smallest point on the solder against the shoulder measured with the point of the Vernier will be the final measurement. ([Appendix B and C](#)).

### **31. ENGINES**

**a. KZ2 FIA specified**

Only reed-valve intakes are authorised. The original parts of the homologated engine must always comply with and be as per the photographs, drawings, materials and physical dimensions described on the Homologation Form.

**b. Modifications to the homologated engine that are allowed**

Reed manifold can be modified e.g. polishing, grinding, sand blasting. Strictly no material may be added. A maximum of 31.5mm throat diameter is permitted. Crankcase may be cleaned and polished and sand blasted. Strictly no material may be added. As per homologation sheet and only original TM Racing parts as per the homologated motors to be used. Crankshaft may only be statically balanced. Standard conrods as per homologated spares list may be polished but not lightened. Carburettors can be polished but the venturi must be a maximum of 30mm and the profile has to remain as per the original Dell'Orto VHS 30 CS profile. External water flow U-tube from the barrel to crankcase can be removed and sealed due to seat positioning for the taller or larger competitor.

**c. Modifications to the homologated engine that are NOT allowed**  
**Inside the engine**

The stroke, the bore (outside the maximum limits), the connecting rod centreline, the number

of transfer ducts and inlet ports in the cylinder and crankcase, the number of exhaust ports and ducts. The crankshaft may not be DYNAMICALLY BALANCED (grinding or removal of material is prohibited). The Reed Valve must be as supplied with strictly no machining permitted. Other restrictions according to the specific regulations.

#### **Outside the engine**

Number of carburettors and diameter of choke. All the clutch components must be original as per motors Homologation Form without any modifications.

#### **External appearance of the fitted engine**

The following are not considered to be modifications to the external appearance of the engine:

Modification of the colour of the parts, the trimming of cooling connections and modification of the fixations (including but not limited to fixations of the carburettor, of the ignition, of the exhaust, of the clutch or of the engine itself), provided that their homologated position is not modified.

### **32. GEAR SHIFT**

- a. Only hand operated gear shift is allowed.
- b. Paddle shift with a push pull cable is permitted.
- c. An Electronic paddle shift is permitted.
- d. Any form of Ignition cutting is strictly forbidden.

### **33. REAR AXLES**

- a. It is permitted to have rear axle insert so as to strengthen the keyway area where the axle sprocket is located.
- b. The maximum rear axle width from outside rim to outside rim is 1400mm (not tyres).

### **34. AIR BOX MODIFICATION**

- a. Only FIA Karting air boxes must be fitted.
- b. In the event of rain to protect the motor from water damage a protective device may be fitted. This device must be securely fitted. Duct tape is permitted to help secure the device.

### **35. DOCUMENTATION SPEC SHEETS**

Available for download on <https://www.motorsport.co.za>