



NEW COMPETITION ENGINES

Statement on the Introduction of New Engines for Karting Australia Competition from the Commencement of 2015.

Executive Summary

- The **“IAME KA100” ReedJet** engine will be introduced into competition for Junior and Senior Classes from the commencement of 2015.
- The **“Vortex Mini Rok”** engine will be introduced into competition for “under-age” competition (formerly Cadet and Rookie) from the commencement of 2015.
- The **Rotax “Micro Max” and “Mini Max”** engines will be introduced into the Rotax Pro Tour Series in 2015. They will become eligible for Club competition in 2016.
- The Yamaha J and S engines will be progressively phased out of National Championship and State Championship competition over the next few years.
 - They will not be eligible for National Championship competition from the start of 2015.
 - They will be eligible for State Championships for 2015 and 2016.
 - They will remain eligible for Club competition indefinitely.
- The Comer SW80 engine will be progressively phased out of State Championship competition over the next few years.
 - They will remain eligible for Club competition indefinitely.
- TaG 125 will remain an open engine Class of competition.
 - The **“PRD Galaxy”** engine will be approved for competition from the start of 2015.
- The **2014 KF2 CIK-FIA homologated** engines (currently used in Europe) and limited to 15,000 RPM will be introduced into KF2 competition from the start of 2015.
 - The current KF2 engine will remain eligible for competition with a limit of 16,000 RPM.
- The **“Subaru KX21”** engine will be approved for use in Endurance Karting activities sanctioned under Chapter 46 of the KA Rules.



THE NEED FOR NEW ENGINES IN AUSTRALIAN KARTING

So much of the discussion within karting centres on the vexing questions related to engines. These questions and discussions run across classes and age groups. Invariably the discussions centre on:

- Performance
- Cost of initial purchase
- Cost and frequency of rebuilds
- Inconsistency of engines “out of the box”
- Parity – against other makes in some classes and against the same make and model in the National and Clubman Classes
- How can I get a good Yamaha “J” or “S” engine and what will it cost?
- The overall life of engines
- The needs of the sport and the competitors when measured against the wants, desires and commercial imperatives of the engine builders and tuners
- Passionate supporters/lovers of their particular brand of engine

Engines, along with the required classes of competition and weight groupings are the most emotional of all discussions in karting.

The Board has recognised that the introduction of new engines to karting and the potential phasing out of old engines will be the single item that causes the most discussion and the highest levels of emotion emanating from this review.

It has been recognised as the biggest issue confronting the sport for many years. It led to the “Future Engines” discussions, working groups and programs in 2012/2013 and was left to the new Board to resolve.

In assessing the issues we have assessed the overriding philosophies of the AKA Inc. in establishing the previous Future Engines working groups and further refined them. The philosophical imperatives and drivers of the previous decisions are worth repeating.

“Junior and Senior Engines

In Australia, two long established and well supported domestic classes exist.

They are Clubman, which uses the Yamaha KT100S engine producing 17-18hp and National, which uses the Yamaha KT100J engine which produces 11-12 hp.

The Australian Karting Association Inc. (“AKA”) wishes to improve the Clubman and National classes... (and sought from manufacturers) information on potential replacement kart engines for the Clubman and National classes.

The AKA wishes to replace the two engines currently used in these classes with a single engine.

The goal of the proposed change is to provide:

- *one engine that offers long life,*
- *has a very high degree of parity between engines and*
- *is therefore overall, more cost effective.*



There are additional benefits from Clubman and National classes having essentially the same engine.

For existing competitors:

- *improved parity will encourage greater competition and*
- *will allow for easy and low cost transition between classes.*

For industry:

- *there will be benefits in the reduction of inventory required and*
- *economies of scale.*

A phase out period for the existing Clubman and National class engines will be defined and implemented.

After this time the future engine selected by the AKA will be the sole engine eligible for the AKA Clubman and National classes.”

Cadet and Rookie Engines

“The intent is to introduce a new engine into the Cadet and Rookie classes that:

- *has parity*
- *is cost effective*
- *is light weight*
- *has a long life*
- *can easily be transitioned from Cadets to Rookies*
- *will create stability and secure the future of this sector Australian Karting*

After an initial transition period it is intended that the selected engine will become the sole engine to be used in the Cadet and Rookie classes.”



OUR GUIDING PRINCIPLES ON NEW ENGINES

In selecting engines as replacements for the Under Age Classes and the Junior and Senior Classes the Board has determined that it should apply the following principles in the decision making processes.

The new engines that will be homologated by Karting Australia and approved for use in competition in these Classes must be:

- Manufactured by world class race engine manufacturers.
- Purpose designed and built kart race engines.
- Built to international safety standards for karting engines.
- Built to international standards with manufacturing and build tolerances that should be expected in motor racing.
- Must be TaG style engines.
- Cost effective to purchase, run and rebuild, having a long life and reasonable rebuild costs.
- Have an exceptional level of parity, consistency and repeatability from engine to engine (out of the box.)
- **“Pathway Engines”** that that can be simply and inexpensively upgraded or downgraded for performance generally through the use of simple restrictor technology and thereby able to be used in multiple classes of competition.
- Be repaired and rebuilt solely with original equipment (**OEM**) spare parts available from the same manufacturer.
- Be slightly faster than the current engines that are in use.
- Have a higher reliability factor than the current engines that are in use.
- Run at cooler temperatures than the current engines that are in use.
- Be provided as a complete package that does not require additional components to be purchased prior to use. (i.e. includes: engine, muffler, carburettor, starter, ignition, wiring loom, battery, battery box, restrictor, engine mounts.)
- Not require in-race carburettor adjustment to achieve performance.
- Not require ‘blueprinting’.
- Readily available in suitable quantities for the commencement of the 2015 Championships and be distributed nationally.
- Have a precision CNC cylinder.
- Simply scrutineered and checked for compliance.
- Be available to Competitors for at least 10 years.



SELECTION METHODOLOGY

A crucial and integral part of this Whole of Sport Review has been our considerations, recommendations and then ultimately our decisions on new engines for use in competition.

We have recognised that it has been essential to adopt a process driven approach that is independent of external forces that would seek to influence or corrupt our considerations.

For the avoidance of all doubt, the following process has been adopted:

1. Review of Whole Of Sport Review Survey Comments – early 2014.
2. Review of the AKA Inc. “Future Engines Projects” considerations, processes and preliminary conclusions (that were all put on indefinite hold by AKA Inc. prior to the handover to KA in September 2013).
3. Establishment of our Guiding Principles On New Engines.
4. Direct communications with world class karting engine manufacturers (“**Engine Manufacturers**”) who possess the capability to deliver to Australian karting a product or products that would meet KA’s identified criteria and requirements.
5. Communications with relevant Australian agents* of these Engine Manufacturers*.
6. Development of a short list of potential new engines for further evaluation.
7. Development by the National Technical Commissioner, the CEO, and the Chairman of an independent testing and evaluation process of all new engines under consideration that included:
 - a. Receipt of engines and associate technical data for testing and evaluation;
 - b. Dynamometer evaluation of the new engines;
 - c. On-track benchmarking of the potential new engines against engines that are currently used in KA Competition;
 - d. On-track testing of all potential new engines in variable ‘race runs’;
 - e. Benchmarking of the potential new engines against each other;
 - f. Evaluation of the performance of the potential new engines in multiple restricted and unrestricted formats;
 - g. Collection of the pre-determined technical data recorded during the tests;
 - h. Evaluation of the technical data by the National Technical Inspector;
 - i. Evaluation of feedback from the test drivers used for the testing.
8. Conduct of dynamometer testing of the engines.
9. Conduct of on-track testing of the proposed new engines and collection of data and driver feedback.
10. Independent** review of the combined testing results recorded.
11. Review of the driver feedback.
12. Establishment of the preferred engines with nominated restrictor size for use as Cadet 9, Cadet 12, Junior and Senior engines.
13. Commercial negotiations with the potential suppliers and their Australian agents (if any.)



* No engine manufacturer nor the Australian agent of any engine manufacturer has in any way whatsoever been engaged in or involved in the testing and evaluation process of the potential new engines, past ensuring the supply and delivery to KA's nominated secure facility of the engines and associated components required for testing by KA.

** "Independent" means that the personnel involved in all levels of the decision making process have no conflict of interest or pecuniary interest (by definition: *an interest that a person has in a matter because of a reasonable likelihood or expectation of appreciable financial gain or loss to the person*) in Australian karting nor are they in any way involved in the supply, maintenance, repair, rebuild of any karting engines other than those that may be used for their own personal competition. i.e. they do not stand to gain or lose personally from being involved in this process or any of the outcomes of the process.

SINGLE SUPPLIERS

KA has identified specific circumstances related to its competitions which merit the appointment of a single supplier of certain items of equipment (such as engines and tyres).

The decision to appoint a single engine supplier in certain Classes was based on a number of elements, including, but not limited to:

Fairness

A single supplier improves KA's ability to verify that each competitor is using equipment that is in compliance with the applicable rules.

It is necessary to "level the playing field" between participants in order to preserve the element of sporting chance and to ensure that sporting skill (rather than investment in technology) continues to be properly rewarded;

Safety

Although all equipment must meet minimum safety criteria, in some circumstances having a single product is the best way to ensure that compliance with the relevant standards is properly verifiable.

Cost

The appointment of a single supplier can lead to significant cost reductions for participants. Cost reduction ensures that the sport remains primarily a test of sporting skill (rather than a competition to see who can raise the largest budget).

In addition, the reduction of equipment costs allows karting competitions to remain open to greater numbers of participants.

The Board's decision to appoint single suppliers of engines (and other products such as tyres) was (and will always be) formed after careful consideration and weighing up the advantages and disadvantages of such a decision. As part of its governance and sporting mandate, KA may occasionally take difficult decisions in balancing the interests of parties.

KA endeavors to conduct its activities in this regard on an open, transparent and fair basis. However, as with all decisions, affecting diverse interests, it may not always be possible to satisfy all parties.

THE NEW 'PATHWAY ENGINES'

The **Vortex Mini Rok** (60cc engine for use in Cadet 9 and Cadet 12 competition) and the **IAME KA100 ReedJet** (100cc ReedJet engine for use in Junior and Senior competition) will be introduced to Australian karting competition from the commencement of the 2015 season.

New Cadet 9 and Cadet 12 Engine (Formerly Cadet and Rookie Classes)



Vortex Mini Rok 60cc TaG Air Cooled Engine

Age Group/Class Cadet 9 – Restricted (16.1mm Restrictor) Cadet 12 – Unrestricted



- The Vortex Mini Rok is a world class engine manufactured by the OTK Kart Group.
- Vortex Mini Rok engine is a very reliable engine. Its specifications have remained the same since the engine was introduced to the world market 12 years ago.
- Vortex Mini Rok is a 60 cc air cooled engine specifically designed for Karting.
- Engine weight is 18kg including all components and accessories.
- The engine is compatible with all chassis', is easy to operate and maintain with long life between rebuilds and freshen up maintenance.
- Australia will be the 19th country to adopt the Vortex Mini Rok engine as a control engine for under age classes of competition.
- The Vortex Mini Rok engine is able to be used in both Cadet 9 and Cadet 12 Classes with minimal cost and minor changes.
 - The engine power is reduced or increased simply by using or not using an exhaust restrictor.

- **Maintenance Schedule and Adjustments**

Spark Plug	Change	After 30 hours
Clutch	Change	After 30 hours
Piston	Change	After 30 hours
Cylinder	Honing	After 30 hours
Connecting Rod	Change	After 90 hours
Bottom End	Re-built	After 90 hours



Technical Features:

CYLINDER VOLUME:	60cc max.
BORE:	42.1mm
STROKE:	43.00mm
STARTER:	Electric TaG
TRANSMISSION:	Centrifugal Dry Clutch
COOLING SYSTEM:	Air Cooled
MODEL:	Mini Rok 2013
CATEGORY:	Cadet 9 – 16.1mm restrictor Cadet 12 - Unrestricted
HOMOLOGATION:	Australia
NUMBER OF TRANSFERS:	2
OUTPUT:	Cadet 9: 7.6 HP Cadet 12: 10 HP
ADMISSION SYSTEM:	Piston Port
CARBURETTOR:	Dell'Orto PHBG Ø 18 mm
EXHAUST MUFFLER:	Homologated with Engine

Maximum Recommended Retail Price: \$2990.00



New Junior and Senior Engine



KA100 REEDJET 100cc TaG Air Cooled Engine

KA Junior - IAME 100KA ReedJet 100cc (19mm Restricted)

KA1 (Senior) - IAME 100KA ReedJet 100cc (Unrestricted)

Junior and Senior National - IAME 100KA ReedJet 100cc (19mm Restricted)

Junior and Senior Clubman - IAME 100KA ReedJet 100cc (Unrestricted)

- The IAME KA100 will be a world class engine manufactured by IAME.
- IAME KA100 is a 100cc air cooled ReedJet engine specifically designed and developed for Karting Australia and that is intended to be taken to the world market by IAME.
- The bottom end of the engine has the robustness of a 125cc engine while the cylinder and head are made to 100cc specification providing a relatively unstressed, reliable power plant.
- Engine weight is 22kg including all components and accessories. It is compatible with all chassis', is easy to operate and maintain with long life between rebuilds and freshen up maintenance.
- The IAME KA100 engine is able to be used in both junior and senior Classes with minimal cost and minor changes.
- The engine power is reduced or increased simply by using or not using an exhaust restrictor.
- Cost effective to purchase and race:
 - The maximum recommended retail price of the IAME KA100 ReedJet will be \$3,150.00.
 - No blueprinting is required.
 - Everything that a competitor needs to put the engine on their kart is "in the box".
 - There is nothing more to buy (apart from fuel) before you race it for the first time.
 - This compares to the former engines;
 - Yamaha KT100J (Blueprinted): \$2500.00
 - Yamaha KT100S (Blueprinted): \$2300.00
 - Plus you then have to buy: starter and battery, header pipe, flex, muffler and exhaust, airbox and clutch.
 - KT100J 'ready to race price': \$3459.00
 - KT100S 'ready to race price': \$3659.00

Price Comparison

IAME	Engine	Starter	Header Pipe	Exhaust Flex & Springs	Exhaust	Air Box	Clutch	Total
IAME KA100	\$3150.00	Included	Included	Included	Included	Included	Included	\$3150.00
YAMAHA	Engine	Coleman Starter	Header Pipe	Exhaust Flex & Springs	Exhaust	Air Box	Tomar Clutch	Total
Yamaha KT100S	\$2500.00*	\$340.00	\$95.00	\$10.00	\$158.00	\$77.00	\$479.00	\$3659.00
Yamaha KT100J	\$2300.00*	\$340.00	\$95.00	\$10.00	\$158.00	\$77.00	\$479.00	\$3459.00

* Blueprinted engine. Yamaha prices shown are the average of prices obtained from multiple reputable engine tuners.

Prices include GST

Technical Features:

- Class: KA Junior, KA Senior, Clubman, National
- Engine Type: OTTO / 2-Stroke single cylinder
- Bore: Ø48.20mm - Ø48.53mm max
- Stroke: 54.00mm
- Displacement: 98.53cc - 100.00cc max
- Max. power: 22.0 Hp at 10.250 RPM
(Max. power: 13.0 Hp at 9.500 RPM)
- Max. torque: 15.0 Nm at 9.750 RPM
(Max. torque: 9.0 Nm at 9.000 RPM)
- Inlet System: Reed valve in the crankcase
- Lubrication: Fuel / Oil Mixture 5%
- Ignition: Analogical with adjustable advance
- Starting: On board Electric Starter
- Clutch: 3-mass Centrifugal Dry



Air cooled and complete with:

- Ignition with H.T. coil
- Reinforced wiring loom with pushbuttons
- Lateral cockpit for pushbuttons
- NGK BR10EG spark-plug and resistive cap
- Centrifugal clutch assembly with z11 interchangeable sprocket
- TILLOTSON HL Ø23mm carburettor (expressly designed for this engine)
- Exhaust manifold
(Exhaust manifold with restrictor)
- One-piece exhaust muffler, with integrated silencer
- Inlet silencer

Engine weight complete with accessories: 22 kg (approx.)

Expected Component Life – IAME KA100

Component	Expected Life (Hours)	Component	Expected Life (Hours)
Cylinder Head	LIFE	Ignition Coil	520
Cylinder	520	Clutch - complete	80
Exhaust Header & Muffler	400	Clutch Drum & Sprocket	80
Carburettor	LIFE	Clutch Lining/shoe set	80
Crankshaft Assembly	520	Starter motor	200
Conrod Assembly (Includes Conrod, big end roller cage, crankpin, bearing)	120	Starter Ring Gear	200
Piston and Piston Ring/s	20	Reed Petals Set	40
Piston Pin	20	Crankshaft Main Bearing	60
Piston Needle Bearing	20	Crankshaft Seal	60
Ignition System - complete	520	19mm Restrictor	LIFE

Suggested Maintenance Intervals – IAME KA100

COMPONENT	WEAR LIMIT	EXPECTED LIFE TIME (operation time)
Complete piston + con-rod small end cage	Piston / Liner Clearance higher than 0.14mm	20 h ~
Con-rod big end cage	Visual check - Respect lifetime	60 h ~
Con-rod	Con-rod big end ovalization higher than 0.01mm	Check 60h, replace 120 h ~
Main bearings	Max clearance between crankshaft and bearing 0.05mm	60 h ~
Half crankshaft (Drive side)	Max clearance between crankshaft and bearing 0.05mm	Check after 60 h
Half crankshaft (Ignition side)	Max clearance between crankshaft and bearing 0.05mm	Check after 60 h
Crankcase oil seal	Check status	60 h ~
Clutch hub	Outer shoes diameter lower than 83mm	Check after 40 h
Clutch drum	Inner diameter higher than 85.2mm	Check after 80 h

Where They Will Race

 Australian Kart Championship – National Introduction Of New Engines and Continuing Eligibility of Old Engines						
Engine	2015		2016		2017	
 Unrestricted 60cc Engine						
Vortex Mini-Rok	Yes		Yes		Yes	
Yamaha KT 100J	Wildcard Entry*		No		No	
 Restricted 100cc Engine (19mm Restrictor)						
IAME KA100 100cc ReedJet	Yes		Yes		Yes	
Yamaha KT 100S	Wildcard Entry*		No		No	
 Unrestricted 100cc Engine						
IAME KA100 100cc Reed Jet	Yes		Yes		Yes	
Yamaha KT 100S	Wildcard Entry*		No		No	
State Championship and Club Competition Introduction Of New Engines and Continuing Eligibility of Old Engines						
	2015		2016		2017 +	
	State Championships	Club	State Championships	Club	State Championships	Club
Cadet 9						
Vortex Mini Rok	Yes	Yes	Yes	Yes	Yes	Yes
Comer SW80	Yes	Yes	Yes	Yes	No*	Yes
Yamaha KT 100J	Yes	Yes	Yes	Yes	No*	Yes
Cadet 12						
Vortex Mini Rok	Yes	Yes	Yes	Yes	Yes	Yes
Yamaha KT 100J	Yes	Yes	Yes	Yes	No*	Yes
Junior National						
IAME KA100	Yes	Yes	Yes	Yes	Yes	Yes
Yamaha KT 100J	Yes	Yes	Yes	Yes	No*	Yes
Junior Clubman						
IAME KA100	Yes	Yes	Yes	Yes	Yes	Yes
Yamaha KT 100S	Yes	Yes	Yes	Yes	No*	Yes
Senior National						
IAME KA100	Yes	Yes	Yes	Yes	Yes	Yes
Yamaha KT 100J	Yes	Yes	Yes	Yes	No*	Yes
Clubman						
IAME KA100	Yes	Yes	Yes	Yes	Yes	Yes
Yamaha KT 100SE	Yes	Yes	Yes	Yes	No*	
Yamaha KT 100SD						
Yamaha KT 100SEC						

* Note that wildcard entry provisions may be available for some competitors using the old engines in some events subject to grid capacity being met by competitors using the new engines.

New Rotax Engines



Micro Max - Cadet 9



Mini Max – Cadet 12

Both the Rotax Micro Max and the Mini Max engines will be available for Rotax Pro-Tour competition from the start of 2015.

ENGINE COMPONENTS

Once homologated, the following engines will only be permitted to be rebuilt and repaired using OEM performance components supplied by the engine manufacturer.

This will apply to the new **Vortex Mini Rok**, Junior and Senior **IAME KA100 100cc ReedJet** “Pathway Engines”, the Iame X30, all Rotax engines and the CIK-FIA homologated engines used in the National Championship Classes.

The list of performance components from the engines will be promulgated by KA.

ENGINE DEVELOPMENT - CLAIMING

Both the Vortex Mini Rok and the IAME KA 100 ReedJet engines are significantly superior, race bred engines that are designed for racing than have been in use in competition to this date.

We expect our karters to experience longer time between top end and bottom end rebuilds of the engines. We also expect that with the move to race bred out of the box racing, that the need for engine development ought to be non-existent.

However the collective experience of the Board and management in motor racing tells us that even where the tolerances are fine and the gains are marginal, such is the nature of motor racing across the world that some people will endeavour to win with the credit card rather than with the outright skill of the driver. This drives unnecessary cost escalation in the sport and should not be tolerated.

So as to reduce the incentive to unnecessarily develop our engines, KA will give full consideration to implementing a **Claiming Rule** at National Championship and State Championship level.

- Any registered competitor will, at the conclusion of a Championship race meeting be permitted to ‘claim’ another Competitor’s engine.
- They will pay a premium of \$500 over the new RRP of that particular engine.
- The Competitor whose engine is being claimed will, if they refuse to sell the engine to the claimer, be excluded from the results of that event.

Note: Information is correct at the time of release but is subject to change at the discretion of the Karting Australia Board.