YAMAHA
KT100J SERIES
TECHNICAL SPECIFICATIONS

VERSION 3 / 2013
UPDATED JANUARY 3rd, 2013

YAMAHA KT100J
TECHNICAL SPECIFICATIONS
DOCUMENT UPDATE SCHEDULE

It is certified that the updates listed below have been approved by the Australian Karting Association and have been incorporated into the document under the relevant rule numbers.

VERSION NUMBER	DESCRIPTION	UPDATED BY	DATE
1	Addition of rules KTJ 1.10(f), (g) and (h) approved at 2011 August NKC meeting.	Brian Sparrow	1-1-2012
1	Addition of wording 'At no point on.....' to rule KTJ 1.05.8, approved at 2011 August NKC meeting.	Brian Sparrow	1-1-2012
2	Compulsory implementation date for rule 1.05.8 to be changed from 1-1-2012 to 1-1-2013, approved at 31-1-2012 NKC teleconference.	Brian Sparrow	1-2-2012
3	Addition of the wording 'centre of the weld at the' to rules KTJ 1.22.5 and 1.23.5 NKC Dec 2012.	Brian Sparrow	3-1-2013
3	Additional wording to rule KTJ 1.04.2 'This may include an aluminium insert' NKC August 2012.	Brian Sparrow	3-1-2013

YAMAHA KT100J
TECHNICAL SPECIFICATIONS

Preamble:

The following are the Technical Specifications for the Yamaha KT100J engine, as approved by the Australian Karting Association.

This engine is approved for use in the following classes.

- Cadets (with a "AKA1" exhaust restrictor and a maximum exhaust length as per rule KTJ 1.22)
- Rookies (with a "AKA2A" exhaust restrictor and a maximum exhaust length as per rule KTJ 1.23)
- Junior National
- Senior National

Unless otherwise specified, the engines must be original in all their components according to the Yamaha KT100J drawings.

Any removal, addition or polishing of material is strictly forbidden.

Sandblasting, glass bead blasting, peening, acid etching, spark eroding and/or any other method of metal removal or displacement is not allowed.

ANY ALTERATIONS / MODIFICATIONS ARE STRICTLY PROHIBITED EXCEPT AS SPECIFICALLY AUTHORISED WITHIN THESE SPECIFICATIONS.

IF THESE SPECIFICATIONS DO NOT SAY YOU CAN MAKE A MODIFICATION, THEN YOU CANNOT.

KTJ 1.01 Engine Displacement:

The maximum piston diameter and stroke length are:-

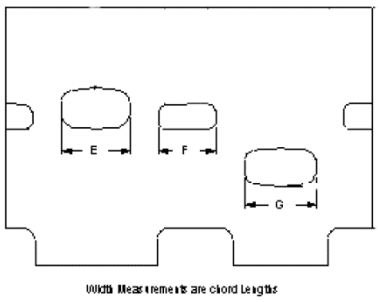
Piston	Stroke
51.00 mm	50.05 mm

KTJ 1.02 Cylinder Machining:

All machined surfaces may be re-machined as long as engine is within any other specifications.

KTJ 1.03 Cylinder Ports:

1. All cylinder ports and passages must be in as cast conditions. No grinding is permitted at the junction of the cast iron liner and the aluminium passages. The only exception being the local grinding of the ejection pin protrusion in the inlet passage adjacent to the external cylinder face.
2. No chamfer on port edges is permitted.
3. Maximum diameter of inlet passage at the external cylinder face is 19.2mm.
4. Inlet tract length including gaskets from cylinder wall to carburettor gasket face to be 53.00mm minimum to 56.00mm maximum including gaskets in front and behind phenolic spacer



CODE	DIMENSION
E	29.60mm max
F	24.45mm max
G	30.60mm max
Port Split 6.00mm minimum High Point, exhaust to transfer.	

KTJ 1.04 Cylinder Head:

1. Must be original Yamaha casting.
2. The welding and remachining of the combustion area, gasket face and spark plug surface is allowable. Any additions/repairs must be permanent and non-adjustable. This may include an aluminium insert.
3. The combustion chamber style is required to have a squish band and chamber which are visually concentric to the spark plug.
4. The combustion chamber volume shall be a minimum of 11cc. Refer Rule 26.01
5. The combustion chamber/squish area shall not protrude beyond the gasket sealing face of the cylinder head.
6. The spark plug thread may be repaired and shall retain its original position in relation to crankshaft axis.
7. Maximum distance from sealing surface of spark plug to combustion chamber sealing face shall be 33.5mm.
8. Repairs to the spark plug sealing face must be by addition of weld material only and re-machining to a flat surface.

KTJ 1.05 Piston:

1. Piston must be approved and 'stock'.
2. Legal pistons are YAMAHA, KSI or Strike with cast piston crowns or "Strike evolution 1" with machined piston crown.
3. All piston crowns to be as manufactured with 100mm radius.
4. Minimum 25.9mm from the top of the gudgeon pin to outer edge of the piston crown.

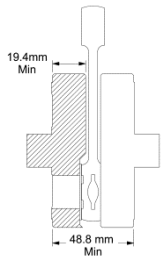
5. Chamfer on skirt of piston to be not more than 0.9mm maximum.
6. It is permissible to notch the piston to accept earless circlips.
7. The piston skirt length may be machined, providing it conforms with the current specifications as laid down in these rules.
   Note: Skirt length must be equal distance on both sides
8. At no point on the inside of the skirt (of a shortened piston) can the chamfer be greater than that allowed on the outside of the skirt. Compulsory from 1-1-2013.

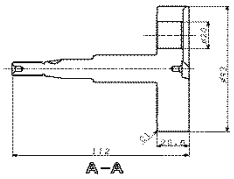
KTJ 1.06 Connecting Rod:

Can be either of the following:

(i) Yamaha (P/N 50W-11651-00, P/N 397-11651-00, P/N 787-11651-01 or P/N 7F6-11651-02),
or

(ii) KSI – No polishing or shot peening allowed.
Minimum/Maximum rod length, centre to centre - 99.87mm - 100.13mm.





KTJ 1.07 Crankshaft:

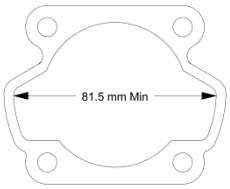
Must be stock and have a minimum width across top of the crankwheel of 48.8mm. Plugging of the counter- balance recesses, shot peening, or polishing are forbidden. Crank pin to be standard solid pin.

The minimum diameter of the crankshaft is 92.7mm. It is permissible to recondition the crank shaft main shaft plating. Repair the drive side crankshaft end, where the threaded section has broken off by drilling and tapping the centre of the crank to accept an M6 or M8 screw.

KTJ 1.08 Crankcase:

The crankcase ports will remain as cast. The minimum chordal distance measured with a vernier calliper across the widest section of the transfer ports shall be 81.5mm minimum.
(Refer diagram below).

NOTE : Existing crankcases that are narrow may be spaced with a thicker gasket.



YAMAHA KT 100 J

DIAGRAM IS FOR DIMENSIONAL REFERENCE ONLY

KTJ 1.09 Ignition:

(i) Must be external rotor type and OEM supply.
(ii) Both CDI and TCI ignition units and Stator Coils as supplied by Yamaha are eligible.
(iii) No modifications or internal repairs to the "black box/control module" or stator coils on the TCI and CDI ignition system with the exception of the spark plug lead, which can be repaired externally only.
(iv) No CDI unit shall vary more than one (1) degrees between 5,000 rpm and 10,000 rpm.
(v) It is permissible to repair/replace the connector for both CDI and TCI modules and mating wire.
(vi) Maximum inside diameter measurement of the ignition rotor to be 62.00mm
(vii) The TCI rotor may be used as a replacement for the CDI rotor. Repolarising of the rotor is permitted.

IGNITION ROTOR

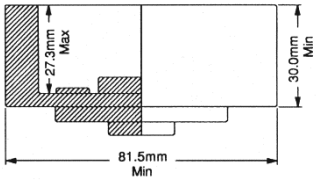


DIAGRAM IS FOR DIMENSIONAL REFERENCE ONLY

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KTJ 1.10 Carburettor:

Must be Walbro WB series conforming to dimensions as per diagram. (Note – WB 24 is not eligible)

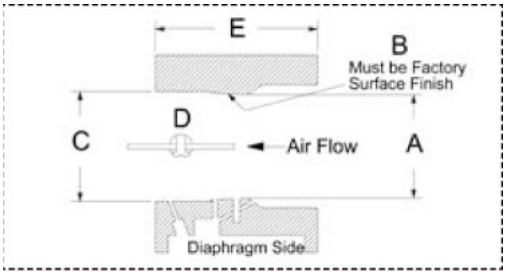


DIAGRAM IS FOR DIMENSIONAL REFERENCE ONLY

Measurement code:

- A As cast MAX Venturi diameter 24.13mm
- B As cast (area will extend from the front of the carburetor to the progression discharge jet which must have all or portion of this jet in the cast area.)
- C MAX downstream diameter 25.7mm
- D Butterfly shaft must be located at the bore centre.
- E MIN carburettor body length of 37.5mm

(a) It is permissible to machine the Walbro carburettor body to
  (i) conform to dimension E
  (ii) conform to dimension C
  (iii) accept an O ring for the low speed jet and throttle shaft.

b) A threaded butterfly screw must be retained, countersunk screws are not permitted. Butterfly and shaft must be as manufactured.

c) It is permissible to repair the inlet seat and throttle shaft bore in the Walbro carburettor. Carburettor bore may not be sleeved.

d) It is permissible to enlarge only existing fuel / air holes, but they may not be deleted or relocated. The holes must be the same shape as originals when viewed externally.

e) All air must pass through the carburettor throat.

f) Adjustment of carburetor jet needles must be done by manually turning the jet needle (or its extension) only.

g) Carburettor throttle cannot be actuated by electro mechanical means.

h) It is permissible to fit a mechanical stop to limit the range of carburetor jet needle movement, however no modifications to the carburetor are permitted to mount such a stop.

No internal inspection required, ie covers will not be removed and only external measurements and visual inspection taken.

KTJ 1.11 Pressurised Fuel Systems:

Fuel pump or pressurised fuel systems are forbidden. Squeeze type pump between fuel tank and carburettor is permitted.

KTJ 1.12 Phenolic Spacer:

To remain as moulded by Yamaha Factory and conform to diagram below. Drilling of the phenolic spacer mounting holes permitted. Sealing face may be re-faced.

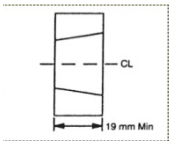


DIAGRAM IS FOR DIMENSIONAL REFERENCE ONLY

KTJ 1.13 External Modifications:

External modifications, which do not in any way affect a performance gain, are legal.

KTJ 1.14 Internal Parts:

All internal parts must be finished as per Yamaha Factory specifications.

KTJ 1.15 Internal Additions:

No additional material may be added except in the case of engine repairs and shall only restore engine or components to original specifications. The cylinder may NOT be repaired in any of the port or passage 'as cast' areas.

(1) The use of thermal barrier coatings / ceramic coatings on or in the engine / engine components and on or in exhaust components is prohibited.

(2) The use of anti friction coatings on or in the engine / engine components is prohibited.

KTJ 1.16 Legal Additions:

Shall be limited to the following: Chain guard, motor mount, direct drive gear, carburettor return springs, extension of carburettor jet needles, third bearing and adaptor, temperature gauge and tachometer.

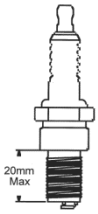
KTJ 1.17 Non-tech Items:

(a) Non-tech items are gaskets, seals, big end roller/cage, little end spacers, rings, washers, cages, fasteners, fulcrum spring (carburetor meter levering spring), spark plug and spark plug lead and cap, gudgeon pins, main bearings, coolant sealing "O" rings, engine sprocket and key.

1. Unless specified, non-tech items are to be of the same type and style as the original. No alteration from the original manufacturer's

specifications is permitted to fit a non-tech item

2. Head gasket/s must be retained
3. Cylinder base baskets are dimensionally free
4. Carburettor base and phenolic spacer gaskets are dimensionally free
5. Only crankcase half gasket may be formed from liquid gasket compounds
6. Cylinder base adjusting shims/spacers may be of any material and must be of uniform thickness.
7. Spark plugs must have a maximum engagement length of 20mm without the washer.



SPARK PLUG

8. A direct drive sprocket (complete) cannot weigh more than 100 gms.
9. A direct drive sprocket retaining nut cannot be made from a hex material greater than 19mm AF.
10. Pull start and electric start systems are non-tech.

KTJ 1.18 Exhaust Header Pipe:

This item is not restricted to the original Manufacturer but must conform to the type (style) and of the original header pipe. Inside diameter must be parallel.

Minimum Length permitted 120mm (as per diagram below)

Maximum inside diameter of 36mm.

Minimum diameter 34mm. Refer diagram

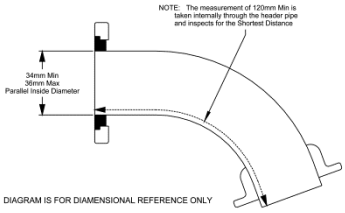
It is permissible to stiffen the exhaust flange to the extent shown in the drawing.

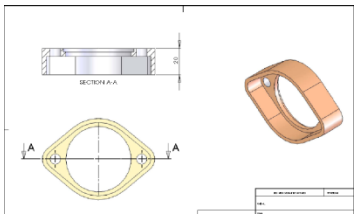
The maximum length from the engine side face of the flange to the end of any stiffening is 20mm

Any stiffening must not interfere with the fitting of exhaust seals.

Modifications to fit an exhaust probe are permissible. A maximum of one (1) Exhaust probe/fitting is permitted. The maximum diameter of the probe is 6mm. Maximum length of exhaust probe is 25mm

Exhaust header studs must remain in their original position.





KTJ 1.19 Exhaust System:

1. Must be such as to carry the exhaust gases away from and to the rear of the driver.
2. Exhaust gases must all pass through the exhaust header pipe and the muffler and silencer (if mandatory) at all times.
3. Mufflers must conform to Rule 24.2 of the AKA manual with respect to noise level. (Supplementary Regulations may allow for a lesser noise level.)
4. The open end must point in such a way so that it does not present a hazard to other drivers.
5. Muffler must be securely fastened with springs to a mounting bracket cradle and to the header pipe of the engine. A secondary fastening system, comprising a multi-strand wire (as used in throttle cables) to be secured through a fixing lug or a similar attachment (e.g. hose clamp) on the muffler and fixed to the chassis, excluding rear bumper bar to prevent the exhaust system detaching from the kart.
6. It is permissible to use, externally, heat proof wrapping between the springs and exhaust cradle and the springs and flex.

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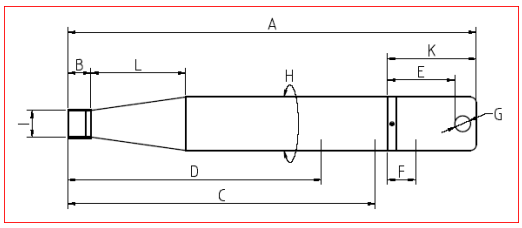
KTJ 1.20 **Exhaust Muffler: AKA 14 CONTROLLED EXHAUST MUFFLER**



Reference	Description	AKA 14
A	overall length	650mm
B	internal tail pipe length	38mm
C	tail pipe to baffle length	512mm
D	tail pipe to deflector length	422mm
E	exhaust outlet hole position	52mm
F	end cap to baffle	47mm
G	maximum diameter outlet hole	19.4mm max
H	circumference	280mm
I	"internal diameter" tail pipe inlet	46.0+/- 1mm
J (not shown)	maximum diameter of internal baffle plate hole	4.5mm max
K	end cap length	123mm
L	inlet pipe to first weld (cone length)	158mm

Dimensional References:

Unless specified as a maximum measurement, the following dimensions are subject to Rule 26.02 General Tolerances, in the AKA Manual.

(a) No device capable of being moved whilst racing is permissible in or on the exhaust.

(b) The only permissible exhaust muffler for classes using the KT100J Engine is the control pipe AKA 14 manufactured by Powermac. The AKA 14 exhaust pipe carries precise dimension specifications that allow confidence in equality of performance for all competitors using the KT100J series engine.

(c) Any measurement related to weld at either end of the cone will be taken to the centre line of the weld.

(d) All other dimensions not specified carry stringent technical specifications. Any attempt to alter these dimensions will deem the unit illegal.

(e) Any accidental damage (when all gasses still pass through the exhaust system as per rule 25.09.2) will not incur a technical breach of these rules.

(f) It is permissible to weld a fixing lug to the external surface of the AKA 14 body.

(g) With the exception of repair to fixing points, any attempt to repair damage by cutting, welding or fabrication will automatically remove eligibility of the exhaust unit.

(h) The exhaust header pipe and muffler can be joined by a pipe or flexible tube with a constant wall thickness, ends must be within 5 degrees of perpendicular to the centreline of the tube, min 36mm ID max 46.5mm OD these being an absolute size all TOLERANCES included. Exhaust spacers are allowed and must be of material equal to the permitted size of the joining exhaust flex or pipe, be of parallel bore, and within 5 degrees of perpendicular.

(i) An "R" end-cap for the AKA39 control pipe is not permitted to be fitted to an AKA14 "J" body and an "R" end-cap for the AKA14 control pipe cannot be fitted to an AKA39 "S" body.

For information and clarification of Exhaust Bodies and End Caps:

- An AKA14 complete exhaust unit is also identified by an alphanumerical stamp on the main body at the inlet end, and on the end-cap. (Eg: S00123456)
- An AKA14 end-cap replacement is identified by an alphanumerical beginning with R on the end-cap (: Eg R123456)
- An AKA39 complete exhaust unit is identified by an alphanumerical stamp on the main body at the inlet end, and on the end-cap. (Eg: S00123456)
- An AKA39 end-cap replacement is identified by an alphanumerical beginning with R on the end-cap (: Eg R123456)
- A pre alpha numerical AKA14 complete exhaust pipe is identified by the AKA14 stamp on the main body of the pipe and the end-cap and is eligible for competition.

  Competitors are requested to check their exhaust pipes for compliance with the new regulation.

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KTJ 1.21 Clutch:

The only permissible clutches to be used with the Yamaha KT100J series engine are the following AKA registered clutches as per rule 25.17 of the AKA Manual.

- Strike SSS — AKA # 38
- Tomar TD22 — AKA # 56
- Ital Red — AKA #55 (long shaft)
- Zedtec ZD1 — (long shaft)

Drive belt pulley — AKA # 52 (Strike SSS clutch) only

KTJ 1.22 CADET CLASS:

1. When the Yamaha KT100J engine is used in the CADET class, the preceeding specifications and tolerances are to be strictly adhered to, but with the INCLUSION of an AKA issued exhaust restrictor plate with a 13.02 mm maximum diameter hole and of 2.1 mm maximum thickness. Restrictor plate must be fitted between the cylinder and exhaust header pipe with a gasket on both sides of the restrictor plate and be located on both exhaust header studs. All exhaust gases must pass through the 13.02 mm max restrictor plate. The exhaust restrictor plates will be supplied by the AKA and identifiable as such - stamped "AKA1".
   NO MODIFICATIONS ARE PERMITTED.
2. It is COMPULSORY that sealable nuts be fitted to the engine exhaust studs on the Yamaha KT100J engine for restrictor plate sealing.
3. A maximum of two gaskets is permissible and shall be as per the original Manufacturer's specification.
3. Restrictor plates to be measured and sealed before competition for State Championships and approved major competitions.
4. Each engine must have its own restrictor and header pipe for sealing. No changing of restrictor or header pipe is allowed.
5. Maximum exhaust length from the exhaust mounting flange (aluminum face of the cylinder) to the centre of the weld at the end of the divergence cone of the AKA 14 muffler is 445mm. (measurement as per following diagram).

KTJ 1.23 ROOKIE CLASS:

1. When the Yamaha KT100J engine is used in the Rookie class, the preceeding specifications and tolerances are to be strictly adhered to, but with the INCLUSION of an exhaust restrictor plate with a 16.00 mm maximum diameter hole and of 2.1 mm maximum thickness. Restrictor plate must be fitted between the cylinder and exhaust header pipe with a gasket on both sides of the restrictor plate and be located on both exhaust header studs. All exhaust gases must pass through the 16.00mm max restrictor plate. The exhaust restrictor plates will be supplied by the AKA and identifiable as such – marked “AKA2A”.
   NO MODIFICATIONS ARE PERMITTED.
2. It is COMPULSORY that sealable nuts be fitted to the engine exhaust studs on the Yamaha KT100J engine for restrictor plate sealing.
3. A maximum of two gaskets is permissible and shall be as per the original Manufacturer's specification.
3. Restrictor plates to be measured and sealed before competition for State Championships and approved major competitions.
4. Each engine must have its own restrictor and header pipe for sealing. No changing of restrictor or header pipe is allowed.
5. Maximum exhaust length measured from the cylinder face exhaust mounting flange position (aluminium face) to the centre of the weld at the end of the divergence cone of the AKA 14 muffler is 445mm. (measurement as per following diagram).