RETRO KARTING AUSTRALIA

CLUBMAN

TECHNICAL SPECIFICATIONS

2024

The following are the Technical Specifications for the Yamaha KT100SE and Yamaha KT100SD engines for use in the Retro Karting Australia Clubman Series.

Unless otherwise specified, the engines must be original in all their components according to the Yamaha KT100S 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.

Engine Displacement:

The maximum piston size and stroke length are:

Piston Size	Stroke
53.20mm	46.13mm

Cylinder Machining:

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

Cylinder Ports:

1. All ports are to be in "as cast" condition except at the junction of the cast iron sleeve and aluminium jacket. Grinding is permitted to remove casting irregularities at the junction ONLY. No chamfer on port edges is permitted.

   This Rule DOES NOT allow grinding or alternations by any method to:

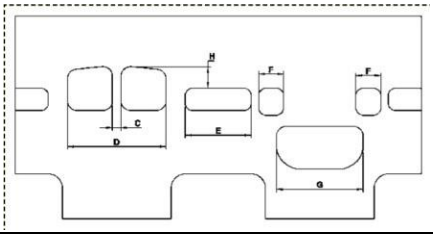
(a) change the roof angle;

(b) alter port height, width or angle;

(c) change the shape or size of the passages from the cylinder base to the port; (d) match the cases to the port passages.

2. Due to manufacturing procedures, it is possible that some engines may have slightly "broken" port edges. When this exists it is uniform on all port edges (tops, bottoms and sides) of all ports in the cylinder. The intersection of the port edges and the cylinder wall must still be within the technical measurements. As the bore size increases the amount of "break" diminishes. If the cylinder bore is 52.45mm or larger, no "broken" edges are allowed.

3. Due to manufacturing procedures, some cylinders have some minor grinding on the transfer divider bridges and some evidence of casting irregularities removed in transfer passages, this includes the transfer area in the crankcase.



COD	DIMENSION	COD	DIMENSION
D	39.60mm max	E	26.15mm max
C	3.40mm min	F	13.13mm max
G	34.80mm max	H	9.50mm min

Cylinder Head:

1. Must be an original Yamaha casting.
2. The welding and re-machining of the combustion area, gasket face is allowable. Additions/repairs must be permanent and nonadjustable.
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.
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. Helicoils and similar are permitted.
7. Maximum distance from sealing surface of spark plug to combustion chamber sealing face shall be 32.5mm.
8. Repairs to the spark plug sealing face must be by addition of weld material only and re-machining to a flat surface.
9. The head gasket must be retained.

Fin Dampeners:

To effectively reduce noise, it is recommended that the Yamaha KT100S Series Engine be fitted with:

(a) Four rows of fin dampeners fitted on the sides of the cylinder.

(b) Two rows of fin dampeners be fitted to the cylinder head.

Piston:

Piston must be approved and stock appearing.

AKA approved/registered pistons are Yamaha, KSI, KSI MK 11, JDP/Vertex and ARC (forged and cast) and Strike.

Bottom of piston should be 90 degrees to sides. It is permissible to notch the piston to allow the removal of circlip. The piston skirt length may be machined, providing it conforms to the current specifications as laid down in these rules.

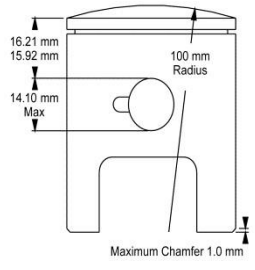


DIAGRAM IS FOR DIMENSIONAL REFERENCE ONLY.

Note: Skirt length must be equal distance on both sides

Connecting Rod:

Can be either of the following and must be stock:

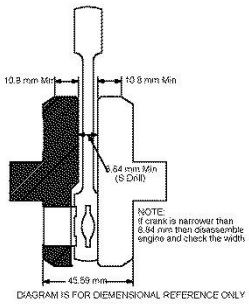
(a) Standard Yamaha ‘S’ or Standard Yamaha ‘J’.

(b) Minimum/Maximum rod length, centre to centre 99.87mm – 100.13mm.

(c) Conrod alignment may be either top or bottom.

(d) Bearings and spacers are non-tech items

Crankshaft:



Legal crankshafts are Yamaha or KSI

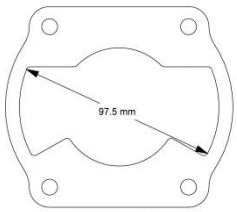
(a) Outside diameter measurement: 86.60mm min., 87.25mm max.

(b) Crank Pin to be standard hollow pin.

(c) It is permissible to recondition the crankshaft main shaft by plating

(d) It is permissible to 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.

Crankcase:



YAMAHA KT 100S

The crankcase ports will remain as cast. The minimum chordal distance measured with a vernier caliper across the widest section of the transfer ports shall be 97.5mm minimum. (Refer diagram below). All machined surfaces may be re-machined as long as engine is within any other specifications within the rules. It is permissible to repair crankcase main bearing recesses by welding or with metal inserts.

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

(DIAGRAM IS FOR DIMENSIONAL REFERENCE ONLY)

Ignition:

a) Ignition must be that supplied by the original engine manufacturer.

The use of the following approved TCI module is permissible:

YAMAHA, VICTA, ATOM, DELTA/WEI SHIEH, PRD, PRD with coil.

No modifications or repairs to any of the listed approved modules is permitted.

The fitting of a PRD ignition coils and a PRD ignition rotors (flywheel) is permissible (this includes the Oppama ignition system).

b) Ignition timing may be adjusted by the removal of the locating key or part thereof.

c) All engines must rotate in a clockwise direction when viewed from the drive side.

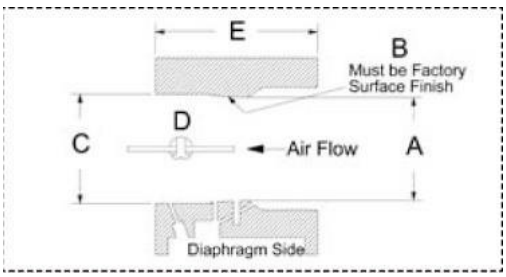
d) Ignition/rotor cover optional

e) It is permissible to repair/replace the connector on the TCI module and mating wiring.

f) The external side face of the ignition rotor can be machined on outer face as long as a witness of some of the writing or lugs still remains.

Carburetor:

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



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 carburetor body length of 37.5mm

DIAGRAM IS FOR DIMENSIONAL REFERENCE ONLY

(a) It is permissible to machine the Walbro carburetor body to

(i) conform to dimension E

(ii) conform to dimension C (provided the machined bore and face remain visually concentric to the cast area).

(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 carburetor. Carburetor 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.

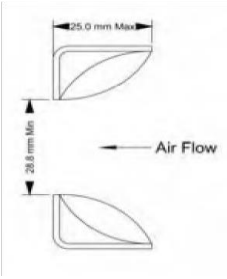
e) All air must pass through the carburetor throat.

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

g) Carburetor 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.

Airbox Adaptor: The airbox adaptor must conform to the following diagram.

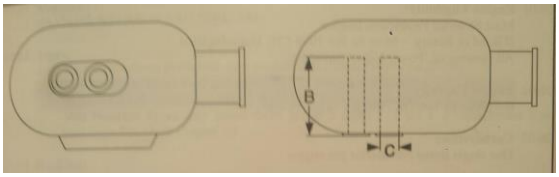


Max. Length: 25.00mm

Min. opening for inlet: 28.80mm

Airbox:

An airbox is compulsory and shall be a 90's style clubman airbox having 2 inlet tubes with max. diameter of 23mm at the opening and minimum. length of 95mm each. Refer to diagram for airbox style.



B: Minimum 95mm **C:** Max. Diameter 23mm at opening

Pressurised Fuel Systems:

Fuel pump or pressurised fuel systems are forbidden.

Phenolic Spacer: Hole size 26.42mm max.

Aluminium Carburetor Mount Plate: Hole size 26.29mm max.

Inlet Tract Length:

The inlet tract has a minimum dimension of 65mm and is to be measured from the aluminium carburetor adaptor outer face to the skirt of piston.

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

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

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.

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

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

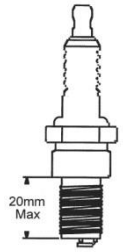
Legal Additions:

Legal additions shall be limited to the following: Chain guard, motor mount, direct drive gear, extension of carburetor jet needles, carburetor return springs, temperature gauge and tachometer.

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 gaskets are dimensionally free
4. Carburetor 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.

Exhaust Header Pipe:

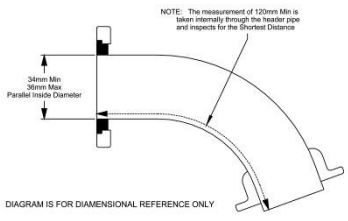
This item is not restricted to the original Manufacturer but must conform to the type (style) and of the original header pipe. Inside diameter must be parallel.

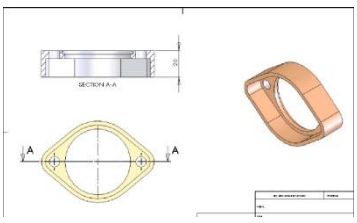
Minimum Length permitted 120mm (as per diagram below) Maximum inside diameter of 36mm.

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. Exhaust header studs must remain in their original position.





Exhaust System:

1. The only permissible muffler for use is the RKA stamped RAAP CX1.
2. No modification in any way is allowed to this muffler.
3. Must be such as to carry the exhaust gases away from and to the rear of the driver.
4. Exhaust gases must all pass through the exhaust header pipe and the muffler at all times.
5. The open end must point in such a way so that it does not present a hazard to other drivers.
6. 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.
7. It is permissible to use, externally, heat proof wrapping between the springs and exhaust cradle and the springs and flex.

Clutch: No clutches are allowed.

Engine Sealing Nuts: A head sealing nut is an extended nut that is sealed at the top and has a minimum 3mm hole that will allow the fitting of an engine seal/tag. The nut must not be able to turn or be removed once fitted with a seal. There must be 2 head sealing nuts fitted to the head adjacent to one another. There must also be one internal hex cylindrical nut fitted to one of the drive side cylinder studs.

GENERAL COMPLIANCE CHECKS

Cylinder Head Volume Measurement:

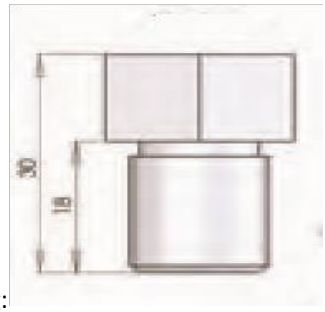
The measuring fluid will be a solution of 50% auto transmission fluid and 50% diesel.
To be measured using a 'B' grade burette with maximum capacity of 50cc (recommended 25cc), calibrated to 1/10th of a cc under gravity feed.

Method:

Allow engine to cool to ambient temperature before measuring head volume.

1. Remove spark plug and insert CC Test Plug.
2. Place piston at approx. TDC.
3. The CC Test Plug to be withdrawn two turns.
4. Insert 11cc of measuring fluid, make sure the fluid is visible in the CC Test Plug.
5. Tighten the CC Test Plug down until it stops.
6. Slowly wind engine over and check the fluid level in CC Test Plug.
7. No fluid shall be expelled through the top of the CC Test Plug.
8. If fluid is expelled then the engine shall be deemed illegal.

Approved CC Test Plug:



Piston Travel Measurement:

1. Insert CC Test Plug and tighten.
2. Zero Digital Vernier to TDC.
3. **Check Stroke** - Rotate engine to BDC, stroke must not exceed 46.13mm
4. **Check Exhaust Duration** – Place a 5 mm pin in the top of the exhaust port and slowly turn the engine in the direction of rotation until the top of the piston touches the 5mm pin which is then "rolled" between the top of the piston and exhaust port to find the highest point of the exhaust port. Using very light pressure to hold the pin in place. Measure with the digital vernier to ensure it is not less than 30.80mm.
   Note: early model KT100S engines have one side of the Exhaust Port slightly higher than the other, the highest port is used for measuring.
5. **Exhaust Inlet Port Split** - Maintain the 5mm pin in the exhaust port, zero the digital vernier to the top of the piston, then remove the pin from the exhaust port. Turn the engine to TDC and insert the 5mm pin into the inlet port and turn engine slowly until piston comes in contact with 5mm pin which is to be "rolled" between the bottom of the inlet port and the piston skirt to find the lowest position of the piston. Measure with digital vernier to ensure it is not less than 14.80mm. If it measures less than 14.80mm then the piston is too short and does not conform.

TDC to exhaust opening: 30.80mm min. Max. Piston Size: 53.20mm

Exhaust open to inlet open: 14.80mm min. Max. Stroke: 46.13mm

Engine internals may be inspected at the discretion of engine measurer to ensure compliance with these rules including bore size, ports etc. This may include stripping the engine apart, it is then the responsibility of the engine owner to have the engine reassembled.