



## KARTSPORT NEW ZEALAND MANUAL

### SECTION N –N1 YAMAHA KT100 PISTON PORT

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#### **N1 YAMAHA KT100S PISTON PORT**

If these rules do not say you can make a modification, you can't.

**N1.1** Engines to have a single cylinder and single stock carburettor and be a stock piston port engine under 101.61 cm<sup>3</sup> (6.218 in<sup>3</sup>) maximum displacement. Unless otherwise specified, all parts are to be of original manufacture and to KartSport New Zealand specifications.

#### **N1.2 LEGAL REMEDIAL MODIFICATIONS:**

**Engine** Identification marks, labels and transfers may be affixed to the external surface of the engine.

Helicoil and threaded inserts.

Unless otherwise specified, external modifications which in no way effect a performance gain are legal.

**Cylinder Head** Welding is permitted to repair damage and return to legal specification.

Non-metallic inserts may be fitted between and through the fins.

Barrels Fins may be welded back onto the barrel.

Non-metallic inserts may be fitted between and through the fins.

Stop drilling of cracked fins.

Drilling for cylinder head location dowels (dowel pins must be removed before competition).

Repairs to scores in cylinder bore.

Repairs to scores or nicks in or on a port face. Repair material must not be more than half the chord width of a port face.

Repairing is permitted to the machined surface on the top of the barrel liner to return to legal specification.

As cast condition may be removed from a cast iron port face.

**Crankshaft** Crankshaft journals including the seal contact area may be refurbished concentric with original centres.

**Crankcase** Aluminium inserts may be installed in the aluminium engine case for worn bearing and seal housings. Original centre lines must be maintained.

Machining damage to a crankcase oil hole is acceptable where a crankcase bearing housing has been inserted.

The use of crankcase gaskets between case halves is permitted.

Welding of engine case for repair purposes.

**Carburettor** 'O' ring and/or sealing devices are approved for carb shafts. This includes the machining of the carb body to install the sealing device.

Inserts may be installed in the carburettor body for worn throttle shaft bearing surfaces.

Brass fuel inlet valve seat may be fitted.

Repairs are permitted to return damaged threads to original condition.

**Ignition Coil** External coil damage may be repaired with Silicone or epoxy.

**N1.3 LEGAL ADDITIONS:** Legal additions shall be limited to the following: air intake silencer to KartSport New Zealand specifications, clutch, muffler, rock guard, chain guard, starter pulley, engine mount, starter nut, header pipe, external extension of carburettor jet needles, carburettor return springs, temperature gauge, tachometer, main bearing shims, ignition module retaining device, crankshaft bearing support, ignition cover spacers 2.54mm (0.100") maximum. Air filter adaptor and or air intake silencer adaptor cannot be velocity stack shaped or act as a ram tube. (Refer notes on air filter adaptors.) Piston exterior surface excluding crown may be coated.

**N1.4 NON-TECH ITEMS:** Unless otherwise specified, non-tech items include gaskets (except for carburettor gaskets, see Rule N1.20), bearings and cages, threaded fasteners, rings, spark plug cap and ignition earth wire.

**Note:** Unless specified, all gaskets and bearings which are non-tech must be of the same diameter, width and outside diameter as original manufacturer's part. Exhaust gaskets must be of the same construction as a genuine Yamaha gasket.

**N1.5 MAIN BEARINGS** to be single row deep groove type. Ball bearings and rings to be metallic. Cages may be non metallic. Other types of bearings are not permitted.

**N1.6 DISPLACEMENT:**The maximum bore and stroke are: BORE 53.000 mm (2.087 in), STROKE 46.13 mm (1.816 in).

**N1.7 EXHAUST, INTAKE AND TRANSFER PORTS:** The port heights and chord widths are NO-GO measurements as per the following diagram. The aluminium surface of all port passages must be in "as cast" condition except for within the following NO-GO measurements:

Outside these measurements, random or irregular factory grinding marks on the as cast surface, which in no way change the port's dimensions will be acceptable. (Smoothing port seams or passages is deemed illegal.)

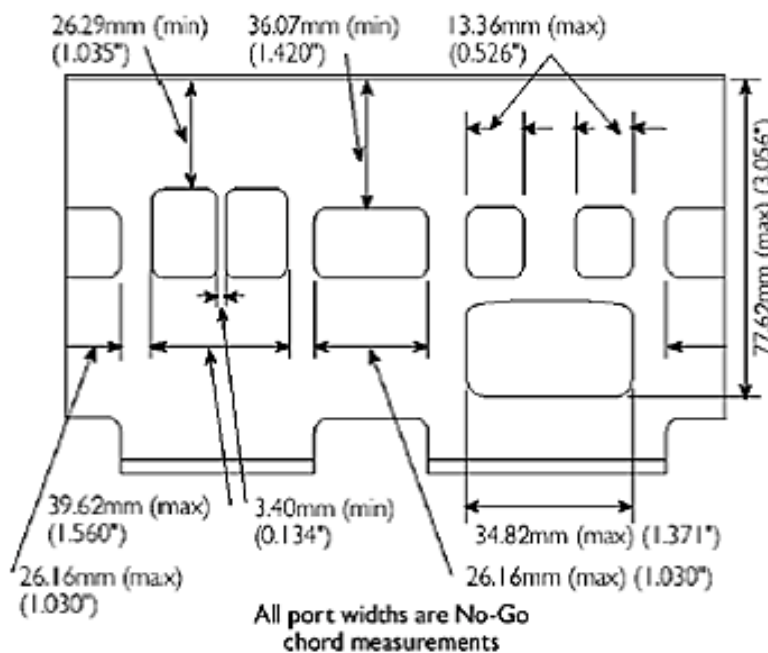
Exhaust and transfer ports are measured from the cylinder wall into the port.

Exhaust	13.00mm max. (0.512")
Transfer	8.00mm max. (0.315")

Inlet port is measured from the phenolic spacer mounting face into the port. (Remove the phenolic spacer mounting gasket.)

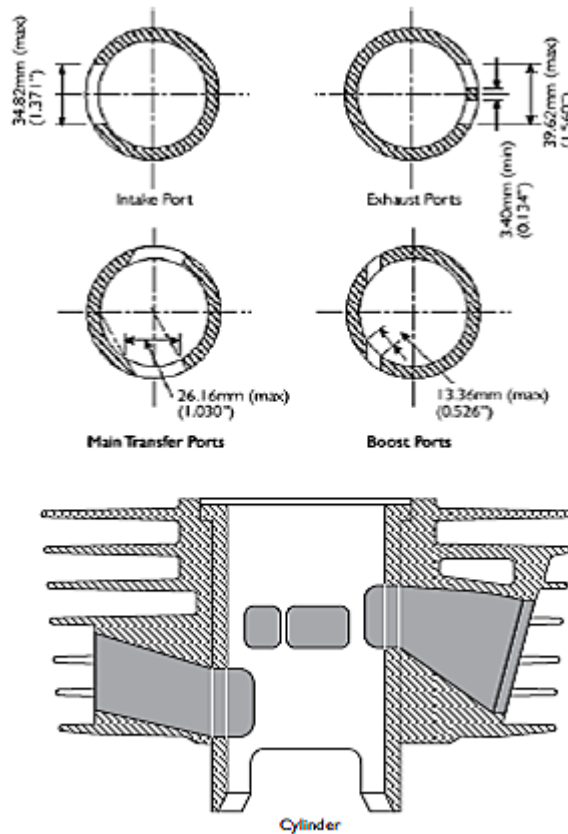
Inlet	32.00 mm min. (1.260")
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No chamfer on port edges.



The Rule does not allow:

- (a) Grinding the aluminium to change the roof or floor angle.
- (b) Grinding to change the shape or size of the passages from the cylinder base to the junction of the aluminium and iron sleeve.
- (c) Grinding to match the cases to the port passages.
- (d) Sandblasting, glass beading, peening, of any kind is not a substitute for "as cast" condition.
- (e) Machining of KT100S cylinders marked "7ET" between the lowest and second lowest fins to comply with KartSport New Zealand technical specifications with or without the original markings.



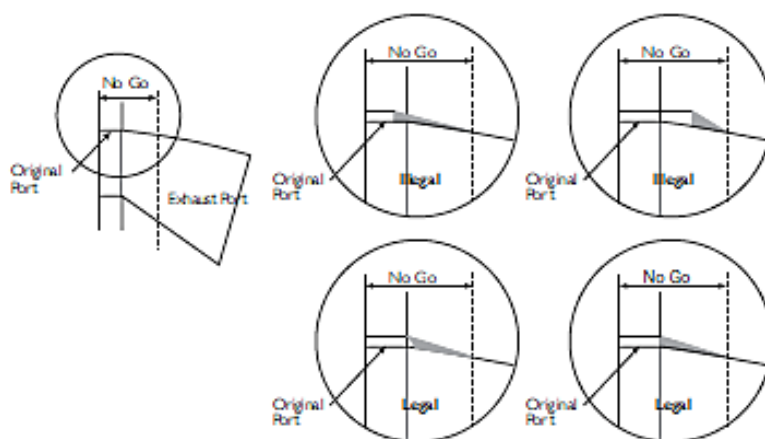
**Note:** Where original factory grinding occurs in a port passage it is in the form of spot facing with a spot facing tool and is below the surface of the aluminium port passage.

**WARNING**

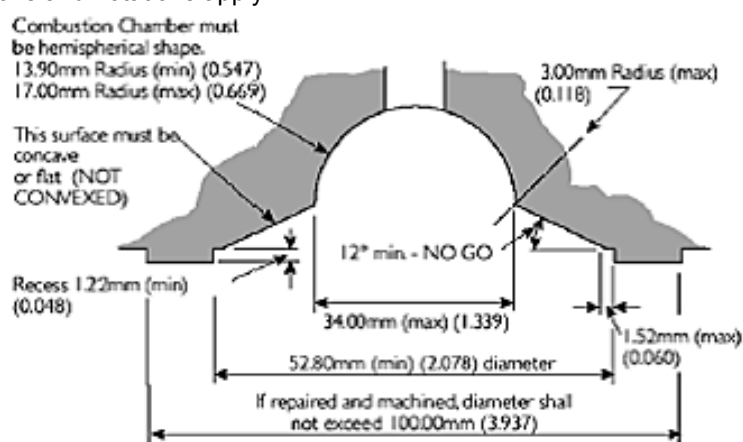
A port consists of four port faces joined by radiused corners. The inlet port bottom face is joined by two 8.5mm minimum radius corners and must be concave or flat not convex. The angle of these faces must be as shown in the diagram of the KT100 cylinder ports.

Top and bottom of all port faces must be at right angles (90 degrees) to the cylinder bore and if ground, to the depth of the cast liner.

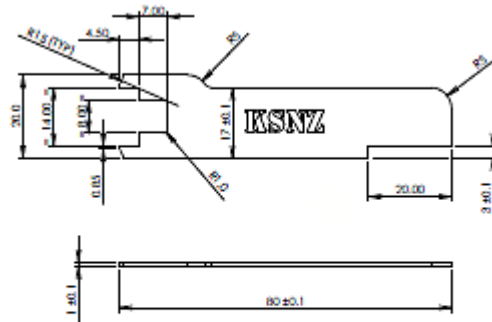
Any grinding of the aluminium must be a smooth transition from the intersection point of the cast liner and the aluminium casting to a point within the no-go area. (Indicated by the shaded areas in the drawing following)



- N1.8 INLET TRACK:** Length measured from the carburettor mounting face to the surface of the cylinder bore diameter 66.04mm (2.600") minimum 68.58mm (2.700") maximum. (Remove the carburettor base gasket.) There must be a minimum of 2 phenolic spacer gaskets fitted as original.
- N1.9 CYLINDER LENGTH:** Measured from the base of the aluminium to the head gasket recess. The cylinder length must be 80.26 mm min (3.160 in) 80.90 mm max (3.185 in).
- N1.10 CYLINDER BASE GASKET:** Cylinder base gasket must be used. Maximum accumulative thickness 1.02 mm (0.040 in). Chemical only gaskets, RTV, silicon etc. are not considered legal.
- N1.11 HEAD GASKET THICKNESS:** Minimum 0.51 mm (0.020 in). Material shall be copper or aluminium. No chemical or sealing compounds allowed.
- N1.12 CYLINDER HEAD:** Must be stock appearing. Any machining of the cylinder head or cylinder liner to accept a sealing device is **ILLEGAL**. The cylinder head recess must not be less than 1.22 mm (0.048 in). The combustion chamber volume must not be less than 11cc. This is measured as per Rule M5. Spark plug protrusion into the combustion chamber will be checked as raced (including any washer or head temp sensor) using the KartSport New Zealand plug protrusion gauge and must not exceed the limit of the gauge. "Stock Appearing" head must be as per the diagram and all dimensions and notations apply.



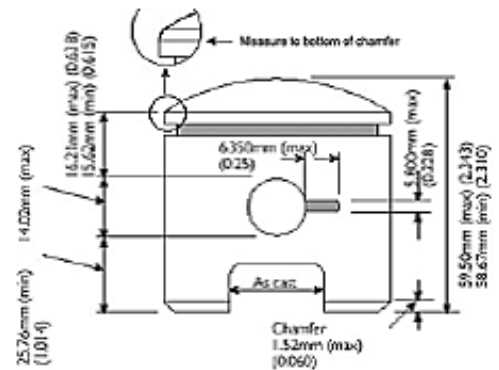
**KSNZ - KT 100 PLUG PROTRUSION GAUGE**



**TOLERANCE:**  
 WHOLE No. +/-0.5mm.  
 1 DEC.PLACE +/-0.1mm.  
 2 DEC.PLACES +/- 0.02mm.  
 SPECIAL LIMITS AS STATED

**MATERIAL:** 1mm S/S

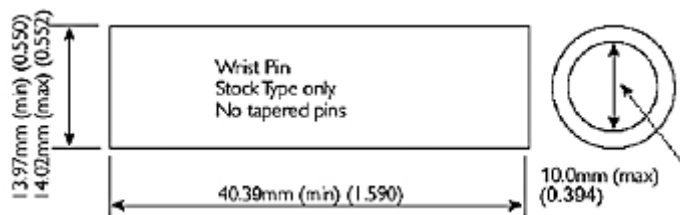
**N1.13 PISTON:** The piston must be an approved single ring only and stock appearing. Legal pistons are Yamaha, Vinart, Strike, and KSI. Bottom of piston must be 90° to the centre line. Chamfer at the intersection at the bottom of the piston skirt and the internal diameter of the piston must be as original manufacture. A chamfer greater than 0.800mm maximum (measured in the same way as the external chamfer on the piston skirt) will be deemed to be illegal. Surface and markings on top of the piston shall remain as supplied by the manufacturer. Transfer area of piston must be as cast. It is permitted to drill a NO GO hole of 1.1mm in the exhaust side of the piston.



Two piston pin circlip removal slots allowed to specification. Position is non-tech.

**N1.14 CONNECTING ROD:** Rod must be of original manufacture or KSI brand part of same specification. Shot peening is allowed. Rod length, centre to centre 99.87 min - 100.13 mm max (3.932 - 3.942 in). No grinding or polishing allowed.

**N1.15 WRIST PIN:** No special alloy. **STOCK TYPE ONLY.** No tapered pins. Pin must be of magnetic material.



**N1.16 CRANKSHAFT:** Crank assembly must be either Yamaha or KSI brand and be as per original manufacturers specification in regard to construction and dimension unless otherwise specified. Either the clutch type or direct drive type drive side crank half may be used. The step in the crankshaft where a clutch drum or sprocket is fitted may be chamfered or relieved to avoid chain damage to the crankshaft.

Internal width between crank halves (Y) should be no less than 8.84 mm min (0.348 in) when checked in situ. If when checked (with crankcase assembled) this dimension is less than this minimum indication, then the crankshaft assembly must be removed from the crankcase to measure the overall width. If the overall width is less than the minimum allowable the crank will be deemed illegal.

Additional machining and/or polishing is allowed. The following specific dimensions apply.

Outside diameter 86.61 mm min, 87.25 mm max, (3.410 in min, 3.435 in max).

Overall width (X) 45.59 mm min (1.795 in).

A = 17.91 mm min, 18.24 mm max (0.705 in min, 0.718 in max)

B = 0.58 mm max (0.023 in max)

Crank shaft seal contact area diameter 19.81 mm min (0.780 in min).

Crankshaft journals including the seal contact area may be refurbished concentric with original centers. Inside diameter of main bearings used with a repaired crankshaft is non tech. Balance weights may be repaired/replaced with items of the same type and material. Extra punch marks are permitted to retain original or replacement balance weights.

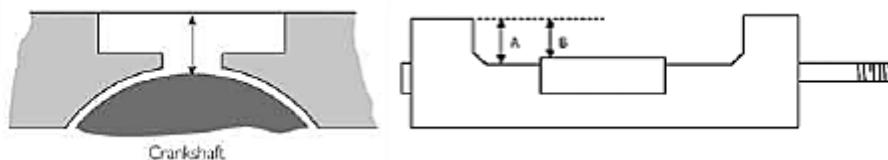
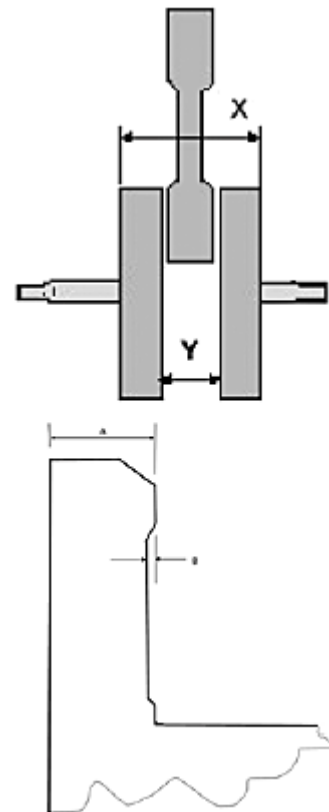
**N1.17 SPACERS:** The conrod shall have two (2) spacers and two (2) caged type bearings only. Piston pin spacer material may be steel, brass or aluminium. Crankpin spacers to be to original specifications. The crankpin and plugs to be to original specifications.

**N1.18 CRANKCASE:** Measure the deck height with a depth micrometer, 21.21 mm min, 21.82 mm max (0.835 - 0.859).

The machined surfaces of the crankcase halves may be re-machined. The following specific dimensions apply, measured with a depth micrometer.

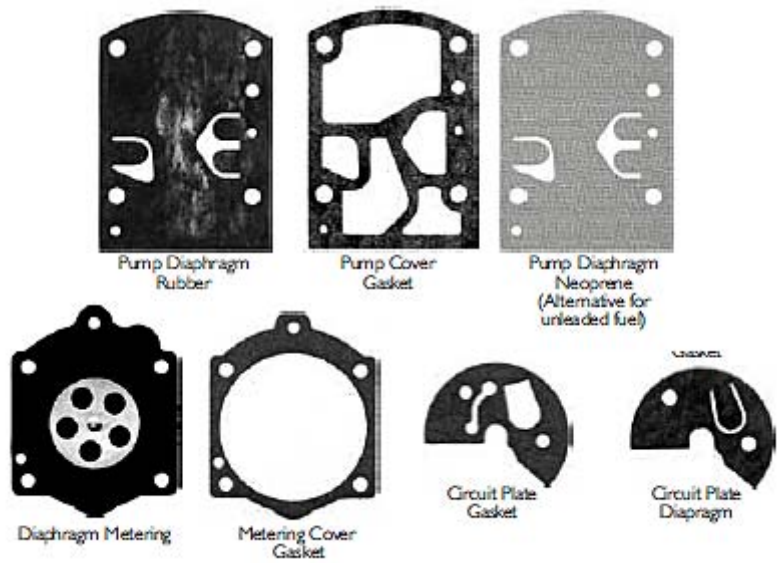
A – 23.11 mm min, 23.75 mm max (0.910 - 0.935 in).

B – 22.81 mm min, 23.24 mm max (0.898 - 0.915 in).

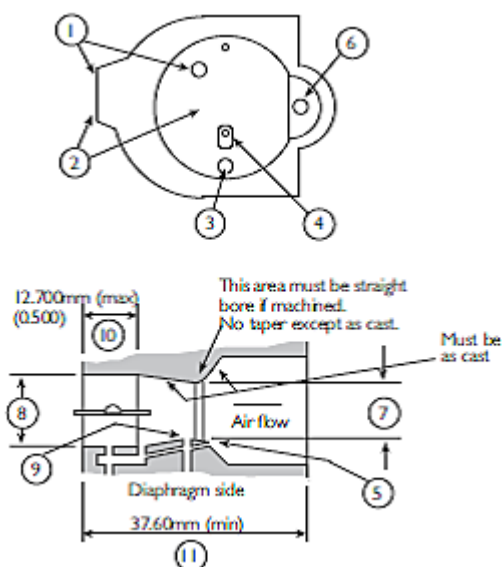


**N1.19 IGNITION:** Ignition must be of original manufacture and stock appearing with exception of the ignition module as noted below. Ignition rotor diameter shall be 59.0mm minimum. Ignition rotor retaining nut must be original 22 mm AF x 10 mm wide. No modification permitted. Ignition rotor key must protrude into both the crankshaft and flywheel (rotor) key slot. Key width shall be 2.95 mm min (0.116 in). Any means taken to alter the coil position is ILLEGAL. Machining the shanks of coil hold down screws to provide additional coil position adjustment IS NOT ALLOWED. Modifying the flywheel (rotor) in any manner in order to change ignition timing is ILLEGAL. Note: The Atom, the Victor11DA-IC and ignition modules that appear similar to those of original manufacture are permitted. Only one ignition module per engine. The ignition cover must be in situ. Any holes in the ignition cover must be used (eg to mount a TCI) and any holes not used must be blanked by means of nut and bolt (with or without washer) or rubber grommet. Adhesive tape is not permitted.

**N1.20 CARBURETTOR:** The Walbro WB3A is the only carburettor to be used and it must be of original manufacture and stock unless otherwise specified. Fuel can only pass through stock metering orifices. Any means taken to bypass fuel to the engine in any other manner is ILLEGAL no matter how it is accomplished. It is permitted to lap the two mounting faces of the carburettor. It is permitted to lap the pumper face of the carburettor. It is permitted to lap the circuit plate. Both filter screens must be intact and in place, in circuit plate and under inlet needle. All gaskets must be fitted. The only carburettor gaskets allowed are as per the diagrams below. The Metering Diaphragm must be of the same thickness and attachment style as original manufacture. Either a Rubber Pump Diaphragm or a Neoprene Pump Diaphragm may be used. All other gaskets must be the same thickness as original manufacture. Any components not specifically called out must be stock appearing. Inlet spring is a non-tech item. Inlet filter screen must be in situ – mesh size is non tech. A Walbrofulcrum arm must be used. Arm height non tech, shape obligatory, contour non tech. The butterfly screw is non tech.







- (1) High Speed Needle Seat 2.06 mm No-Go (0.081in)
- (2) Low Speed Needle Seat 1.51 mm No-Go (0.0595in)
- (3) Idle Jet 1.07 mm No-Go (0.042 in)
- (4) Transition Jet 1.32 mm No-Go (0.052 in)
- (5) Air Pre-mix Orifice Min 0.81 mm No-Go (0.032 in) Max 1.07 mm No-Go (0.042)
- (6) Fuel Inlet Valve Seat 1.63 mm No-Go (0.064 in)
- (7) Diameter at narrowest point of venturi 24.13 mm No-Go (0.950 in)
- (8) Diameter at Flange end 25.65 mm No-Go (1.010in)
- (9) High Speed Jet 1.88 mm No-Go (0.074 in)(Check with bent gauge from inside venturi.)
- (10) Bore must not break into the transition jet hole
- (11) Minimum overall length 37.60mm

**N1.21 FUEL PUMP:** ILLEGAL unless stock equipment with the engine.

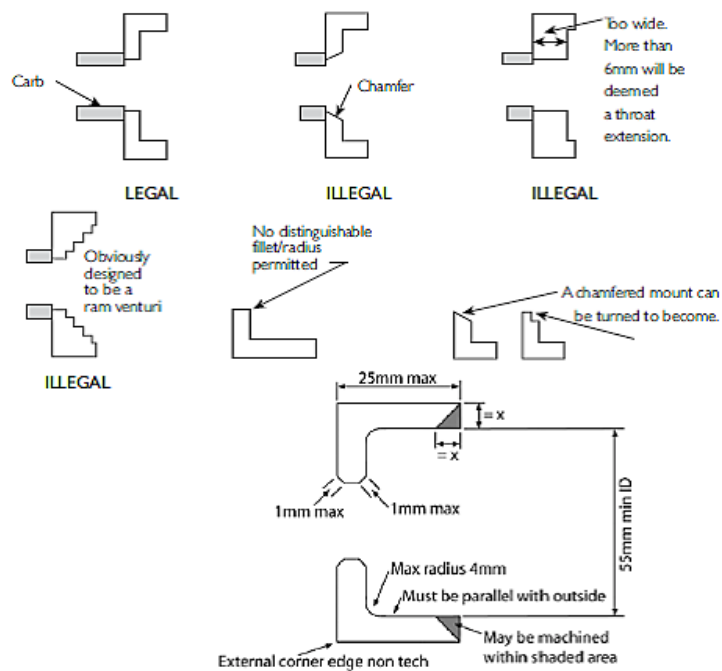
**N1.22 PHENOLIC SPACER:** Thickness 9.15 mm min (0.360 in) 11.43 mm max (0.450 in). Hole size 26.67 mm max (1.050 in). Spacer mounting holes may be drilled to 8.00mm dia. max. (0.315 in).

**N1.23 ALUMINIUM CARBURETTOR MOUNT PLATE:** Thickness 11.69 mm min (0.460 in) 12.19 mm max (0.480 in). Hole size 26.29 mm max (1.035 in).

**N1.24 CRANKCASE PULSE HOLE:** Yamaha nozzle PN-787-13522-00 must be used. Hole not used must be plugged. Internal diameter of pulse pipe to be 3.25 mm No-Go (0.128 in).

**N1.25 AIR FILTER AND/OR ADAPTOR:** The air filter and/or air filter adaptor must not be velocity stacked or act as a ram tube or throat extension. The maximum permissible extension of the throat is 6mm (see diagram on following page). The rear external corner edge is non tech and may be radiused or chamfered. The following diagrams are a guide on the shape.





**N1.26 COATINGS:** The coating of the external surface of the engine cooling fins is not permitted.

**N1.27 SPARK PLUG:** Any propriety brand spark plug may be used.  
Shank length 20mm maximum.

