

# TECHNICAL INFORMATION ON ALL B.M.'s

BY JOHN MILLS

Some confusion seems to occur between the different models of BM engines so to try and clear this we have prepared the table below giving the relative details of each. Externally all the FC models have a crankcase with cooling fins, all other models do not. Internally all European models have a bore and stroke of 48 mm x 25 mm giving a swept volume of 97.7 cc. Models with an iron liner are reborable to a maximum size of 48.55 mm giving a swept volume of 99.98 cc. As the list shows some models have a two-piece crankshaft—where the crankpin is forged as part of the drive side crank half, whilst the others have the three-piece assembly with the separate crankpin. The two-piece crankshaft is more expensive to produce but gives a better inlet port shape owing to the increased bevel on the inlet side crankshaft wheel.

The main differences lie in the connecting rod centres and type of piston used. The early model BMs were very similar to the Saetta and Parilla engines but the FC110 introduced in January '69 broke new ground by having a connecting rod with centres of 110 mm and the piston having the gudgeon pin position moved 4 mm. nearer to the crown. The idea of this was to reduce the angular acceleration of the rod and piston loading. Both items

were made lighter to take advantage of this and to give more acceleration. However trouble was experienced with the piston cracking upwards from the gudgeon pin boss. To combat this the piston was modified with three reinforcement ribs above the gudgeon pin boss instead of the original one. This increased the weight of the piston slightly and together with other technical problems caused a number of connecting rod failures. The increased length of the connecting rod in the FC110 had meant a small loss in primary compression so to offset this early engines were fitted with small piston suffers cast into the mouth of the crankcase. Development, however, showed that these caused obstruction of the gas flow into the engine and the transfer ports and were therefore removed. For America a conversion on the FC110 was to fit a 104 mm. rod with the 1887 piston but this was not homologated for Europe. After a lot of experiments by the factory in 1970 the FC100 and FC106 with a new liner material, new piston, slotted rods and detail improvements were homologated for 1971/72 and the FC110 discontinued. It is possible by machining both the top and mouth of the crankcase, also the base of the cylinder, to convert the FC110 to a similar mechanical specification to the current FC100 or FC106. A warning, however, that this work requires great precision and should only be entrusted to a very competent machining shop.

Currently evaluation experiments are being carried out on three methods of five porting cylinders but so far none have shown a conclusive improvement, some engines are better whilst others are not. If, however, future experiments should prove a conclusive improvement the necessary modifications will be incorporated in production engines.

The port timings in the latest BM engines are the result of years of experimenting and experience and as a result are the best compromise for all round performance and reliability. The karter should always remember that before he decides to alter his ports to improve performance! First check that the engine is mechanically as it should be, i.e. the crankshaft is running completely true and is not nipped in the crankcase. The cylinder bore is round and true and has the correct piston skirt clearance. The piston and connecting rod are the right type as overweight and non-standard parts can upset the crankshaft balance factor and thus reduce both performance and reliability.

Think twice before using that file or rotary cutter. If you still feel compelled to have a "hack" try the rotary valve, that's easier and cheaper to replace.

Model	Introduced	Currently Available U.K.	R.A.C. Class	A.mm	B.mm	C.mm	Asso Piston Type	Remarks
F100	Jan. 65	No	Junior 100 Nat.	155	100	28	1312	Chrome Cylinder 3 Piece Crank
F100 JB	Jan. 67	No	Junior 100 Nat.	155	100	28	1887	Iron Liner 2 Piece Crank
F100 JB	Jan. 69	Yes	Junior 100 Nat.	155	100	28	1969	Iron Liner 3 Piece Crank
FC110	Jan. 69	No	100 Int.	159	110	22	1865	Iron Liner 2 Piece Crank
FC104	1970	No	—	159	104	28	1887	Iron Liner 2 Piece Crank
FC100	Jan. 71	Yes	100 Int.	155	100	28	1969	Iron Liner 2 Piece Crank
FC106	Jan. 71	Yes	100 Int.	155	106	22	1865	Iron Liner 2 Piece Crank

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