

THE 1 $\frac{1}{4}$ LITRE SALOON

SERIES "Y"

THE POWER UNIT

by Eric Blower

JUDGING by the number of requests for the Workshop Manual, which, unfortunately, is now out of print, there are still a great number of these models in the hands of enthusiastic owners who prefer to carry out their own maintenance but require the necessary data to do so.

As it is out of print, we shall compile a series of technical articles for publication in this magazine dealing with the engine, gearbox, axle, etc., and hope they will prove to be of some interest and assistance.

A brief description of the engine may, therefore, be our first step and to be followed by other articles dealing with the lubrication and top and bottom overhauls.

Description of Power Unit

The four-cylinder overhead-valve push-rod-operated engine is built in unit construction with a single dry plate clutch and four-speed gearbox.

The bore diameter is 66.5 mm. which, with the stroke of 90 mm., gives a cubic capacity of 1250 c.c. and a bore/stroke ratio of 1.353 to 1.

The depth of the cylinder head is 76.75 mm.; the combustion space capacity is 45.5 c.c. with a compression ratio of 7.2/7.4 to 1.

The engine develops 46 b.h.p. at 4,800 r.p.m. Maximum torque developed is 702 lb. in. at 2,400 r.p.m.

It has a robust four-throw crankshaft carried in three main renewable steel shell, white-metal-lined bearings, dowel located.

The diameter of the crankshaft main journals is 52 mm. $-\frac{0.35}{0.15}$ mm.

The bore in the crankcase for the main bearings is 56.34 mm. ± 0.1 mm., and the diameter of the main bearings is 52.020 mm./52.005 mm.

The crankshaft thrust is taken on the centre main bearing, which is flanged for the purpose, the main bearing (inter.) end float on the crankshaft being 0.35 mm./0.95 mm.

The main bearing clearance on the crankshaft diameter is 0.020 mm./0.055 mm.

The connecting rod big-ends have renewable thin steel shell, white-metal-lined bearings, which have no flanges, the side thrust being taken on the rod faces. The little-end embracing the gudgeon pin is slotted and fitted with a clamp screw and spring washer, which lock the little-end to the gudgeon pin.

The crankpin journal diameter is 45 mm. $-\frac{0.35}{0.15}$ mm., the diameter of the big-end bearing being 45 mm., which gives a big-end clearance on the crankshaft diameter of 0.11 mm./0.056 mm. Steel connecting rods are employed, 178 mm. in length. The bore at the big-end is 48.658 mm./48.671 mm., with a width of 27.865 mm./27.890 mm.

The bore of the little-end is 18 mm. $+\frac{0.03}{0.01}$ mm., the width being 19 mm.

The pistons are of the aluminium alloy, tin-coated, thermal slot, controlled expansion type, fitted with three rings, two compression and

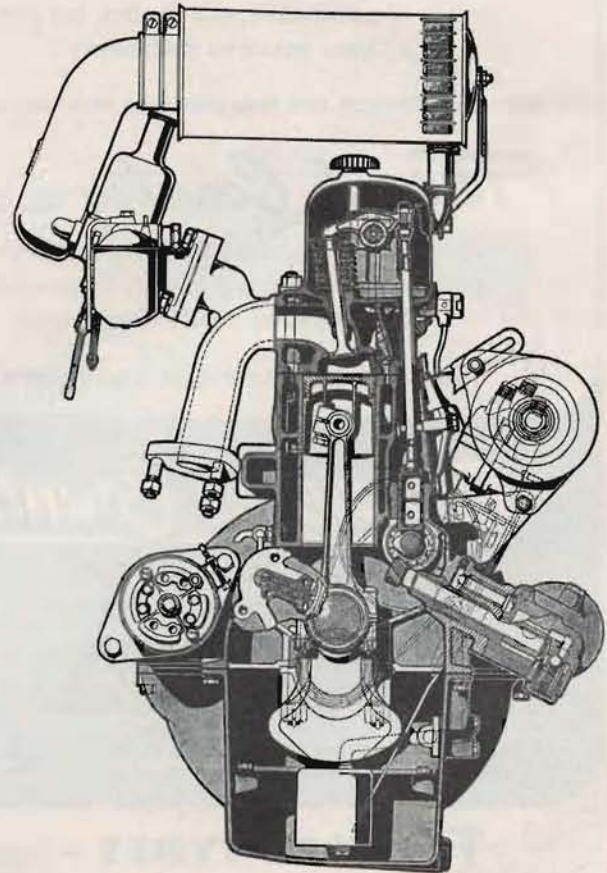
one scraper. The diameter of the compression ring groove is 2.381 in./2.385 in., with a width of 0.0886 in./0.0887 in.

The oil control ring groove is 2.389 in./2.393 in., with a width of 0.1576 in./0.1577 in., the side clearance of the rings in the grooves being 0.001 in./0.002 in.

The two compression rings have a width of 0.0885 in. and a radial thickness of 0.109 in./0.101 in., whereas the eight-slot oil control ring has a width of 0.1575 in. and a radial thickness of 0.105 in./0.097 in. The piston ring gap is 0.006 in./0.010 in.

The gudgeon pin bore in the piston is 18 mm. $-\frac{0.025}{0.076}$ mm., the clamp-type gudgeon pin being 18 mm. $-\frac{0.15}{0.10}$ mm. in diameter and having an overall length of 58.5 mm.

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Sectional view of engine (front).

(CONTINUED)

When fitting new pistons selective assembly is necessary. To facilitate this the pistons are marked on their crowns with an indication of their bore size, the piston markings indicating the correct size cylinder bore for which they are suitable, the correct working clearance having been allowed for in the grading operation.

The bores and pistons are graded in four sizes:

Bores of nominal size ± 000 in. to $+00049$ in.—marked STD.

Bores of nominal size $+0005$ in. to 00099 in.—marked $+0005$

Bores of nominal size $+0010$ in. to 00149 in.—marked $+0010$

Bores of nominal size $+0015$ in. to 00199 in.—marked $+0015$.

The piston clearance is 0021 in. minimum to 0029 in. maximum, measured at the top of the skirt, immediately below the oil return ring, and across the thrust faces, i.e. at 90 degrees to the gudgeon pin axis.

Oversize bores on factory replacement engines supplied by The M.G. Car Co. Ltd. are limited to two oversizes: $+020$ in. graded in four sizes as the standard grading and $+040$ in. graded in four sizes as the standard grading.

The camshaft is driven from the crankshaft by means of a duplex roller chain, the roller being of $\frac{3}{8}$ in. pitch, 60 pitches endless, and the chain being maintained in tension by a hydraulically clamped slipper block type of tensioner. The three camshaft bearings in the cylinder block are fed with oil direct from the main oil gallery.

The front bearing is of white metal, having an outside diameter of 43.61 mm., and is a press fit in the cylinder block. The inside diameter is reamed in position in the block to 41 mm. $\begin{matrix} +05 \text{ mm.} \\ -08 \text{ mm.} \end{matrix}$

The centre and rear bearings are of zinc alloy with an outside diameter of 43.5 mm. $\begin{matrix} +00 \text{ mm.} \\ -02 \text{ mm.} \end{matrix}$ and an inside diameter of 23 mm. $\begin{matrix} +015 \text{ mm.} \\ -005 \text{ mm.} \end{matrix}$

The cylinder block is bored for the bearings to 43.5 mm. $\begin{matrix} +02 \text{ mm.} \\ -01 \text{ mm.} \end{matrix}$

The camshaft bearing diameters are:

Front: 41 mm. $\begin{matrix} +01 \text{ mm.} \\ -02 \text{ mm.} \end{matrix}$

Centre and rear: 23 mm. $\begin{matrix} -05 \text{ mm.} \\ -08 \text{ mm.} \end{matrix}$

The end float is 005 in./ 013 in., and the cam lift up to and including Engine No. XPAG/SC/16830 is 4.334 mm., equal to 6.5 mm. at the valve, and 5.334 mm., equal to 8 mm. at the valve, commencing at Engine No. XPAG/SC/16831.

The camshaft operates the valves through the medium of plunger-type tappets which run direct in the cylinder block. The main oil supply is carried in a detachable aluminium sump. A gear type of oil pump, driven at half engine speed from a helical gear on the camshaft, draws oil through a submerged filter in the sump, delivering it to the various parts of the engine via an external full-flow oil filter.

The capacity of the sump is 9 pints when new, and approx. 7 pints should be added when the sump is drained as approx. 2 pints are left in the pump, filter and galleries. The oil pump by-pass is set at 60 lb./sq. in.

A copper and asbestos gasket is interposed between the detachable cylinder head and the block, the gasket being 045 in. thick.

A few details on the cylinder head may prove to be of use.

The valve port throat diameter for the inlet valve is 30 mm. and for the exhaust valve 26 mm. The valve head diameters are: inlet 33 mm., exhaust 31 mm., with the valve seat at 30 degrees and the valve stem diameter at 8 mm. ± 01 mm.

Cast-iron valve guides are employed, the length of the inlet valve guide being 59 mm. and of the exhaust valve guide 54 mm. The outside diameter is 14 mm. $\begin{matrix} +02 \text{ mm.} \\ -04 \text{ mm.} \end{matrix}$ and the inside diameter 8.06 mm./8.08 mm.

Double valve springs are used, the spring pressures being:

Inner: shut 31 lb., open 43 lb.

Outer: shut 62 lb., open 82 lb.

The valve lift is 6.5 mm.

Engine cooling is by means of the radiator, pump and fan with thermostat control. The cooling water is circulated by means of an impeller mounted on the front wall of the cylinder block and driven in conjunction with the dynamo by a V-belt from a pulley on the forward end of the crankshaft.

The total coolant capacity is $13\frac{1}{2}$ pints and the capacity of the radiator $7\frac{1}{2}$ pints. Two drain taps are provided, one at the base of the radiator and one at the front end of the cylinder block, below the exhaust manifold.

Carburation is by means of a single S.U. $1\frac{1}{4}$ in. semi-downdraught carburetter, type H2, spec. 456, fitted with a combination air cleaner, silencer and special manifold system.

Recommended carburetter needles: Standard "FI", Richer "DK", Weaker "EF", the shoulder of the needle being fitted flush with the face of the piston.

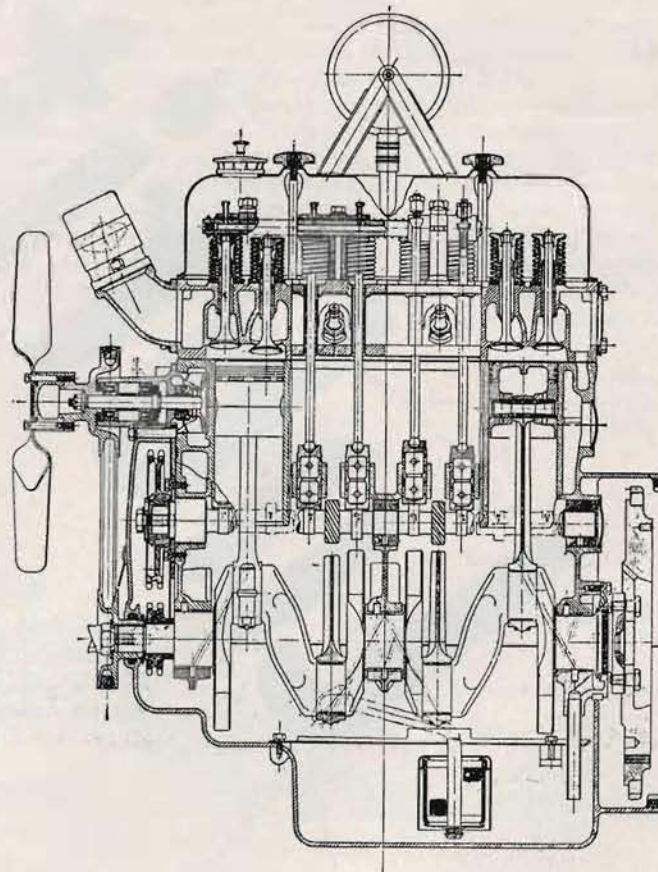
Fuel is drawn from the 8-gallon capacity petrol tank and the level checked by electric gauge on the instrument panel by means of an S.U. 12-volt type L electric pump mounted on the battery box.

The engine power is transmitted to the gearbox by a Borg and Beck single dry plate clutch, $7\frac{1}{2}$ in. diameter up to and including Engine No. XPAG/SC/16915 and 8 in. diameter commencing at Engine No. XPAG/SC/16916.

On the $7\frac{1}{2}$ in. clutch, fabric linings are employed on the clutch centre plate, the thrust springs being red in colour and having a tension of 132 to 143 lb./in.

There are six clutch plate damper springs, three blue on "drive" and three black on "over-run".

On the 8 in. diameter clutch, RYZ facings are used on the centre plate, the clutch thrust springs being brown in colour, having a tension of 150 to 160 lb./in., and the six clutch plate damper springs being black/green.



Sectional near-side view of the engine.