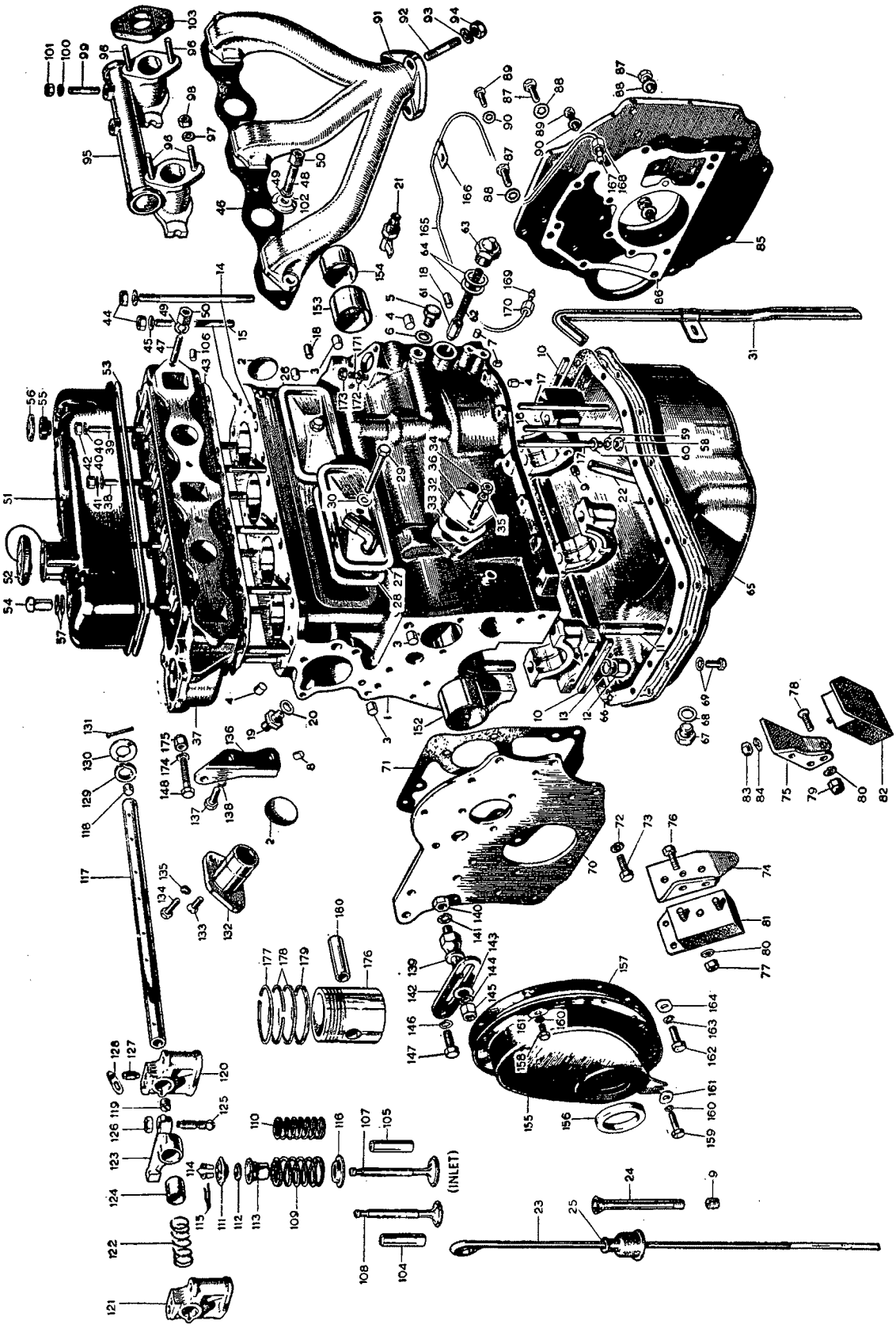
SECTION A

THE ENGINE

THE ENGINE COMPONENTS



KEY TO THE ENGINE COMPONENTS

No.	Description
1.	Block assembly—cylinder.
2.	Plug—core hole.
3.	Plug—oil gallery.
4.	Plug—taper—crankcase oil hole.
5.	Plug—screwed—transverse oil hole.
6.	Washer—plug.
7.	Plug—oil relief valve hole.
8.	Plug—oil filter boss.
9.	Plug—redundant dipper boss (and rear main bearing cap).
10.	Joint—front/rear main bearing cap.
11.	Stud—main bearing cap.
12.	Nut—main bearing cap stud.
13.	Washer—spring.
14.	Stud (long)—cylinder head.
15.	Stud (short)—cylinder head.
16.	Stud (long)—oil pump.
17.	Stud (short)—oil pump.
18.	Dowel—gearbox mounting plate.
19.	Union—oil gauge pipe.
20.	Washer—union.
21.	Tap—water drain.
22.	Pipe—drain—rear bearing cap.
23.	Dipper rod.
24.	Tube—dipper rod.
25.	Dust cap.
26.	Cover—side—rear.
27.	Cover—side—front—with elbow.
28.	Joint—side covers.
29.	Set screw—covers.
30.	Washer—set screw.
31.	Pipe—vent with clip—crankcase.
32.	Plate—cylinder block blanking—N/S.
33.	Joint—blanking plate.
34.	Nut—blanking plate stud.
35.	Washer—blanking plate stud.
36.	Stud—L/H side crankcase blanking plate.
37.	Cylinder head.
38.	Stud—rocker bracket—short.
39.	Stud—rocker bracket—long.
40.	Washer—stud.
41.	Washer—spring—stud.
42.	Nuts—rocker bracket studs.
43.	Joint—head to block.
44.	Nut—cylinder head stud.
45.	Washer—stud.
46.	Joint—manifold to head.
47.	Stud—exhaust manifold to head.
48.	Stud—manifolds to head.
49.	Washer—spring.
50.	Nut—stainless steel.
51.	Cover assembly—rocker gear.
52.	Cap—oil filler and cable.
53.	Joint—cover to head.
54.	Cap nut—cover.
55.	Bush—rubber—cap nut.
56.	Cup washer—bush.
57.	Washer—packing—cover stud.
58.	Nut—oil pump stud.
59.	Washer—spring.
60.	Washer—plain.
61.	Valve—oil relief.
62.	Spring—relief valve.
63.	Cap nut—relief valve.
64.	Washer—cap nut.
65.	Reservoir—oil.
66.	Joint—oil reservoir.
67.	Plug—drain.
68.	Washer—drain plug.
69.	Set screw—reservoir (with captive washer).
70.	Plate—front mounting.
71.	Joint—plate to block.
72.	Washer—spring.
73.	Set screw—plate to block.
74.	Bracket—front R/H.
75.	Bracket—front L/H.
76.	Screw—R/H bracket to mounting plate.
77.	Nut—R/H bracket to plate screw.
78.	Screw—countersunk—L/H bracket to plate.
79.	Nut—countersunk screw.
80.	Washer—spring.
81.	Mounting—R/H—front.
82.	Mounting—L/H—front.
83.	Nut—engine mounting to bracket.
84.	Washer—spring.
85.	Plate—gearbox mounting.
86.	Joint—plate to block.
87.	Set screw—plate to block.
88.	Lock washer—set screw.
89.	Set screw—plate to block.
90.	Lock washer—set screw.
91.	Manifold—exhaust.
92.	Stud—exhaust pipe flange.
93.	Washer.
94.	Nut.
95.	Manifold—induction.
96.	Stud—carburetter.
97.	Washer—spring.
98.	Nut—carburetter stud.
99.	Stud—inlet manifold (accelerator abutment bracket).
100.	Washer—spring.
101.	Nut—inlet manifold stud.
102.	Yoke—manifold.
103.	Washer—carburetter insulating.
104.	Guide—valve—exhaust.
105.	Guide—valve—inlet.
106.	Plug—oil hole.
107.	Valve—inlet.
108.	Valve—exhaust.
109.	Spring—valve (outer).
110.	Spring—valve (inner).
111.	Cup—valve spring.
112.	Packing ring—valve.
113.	Shroud—valve guide.
114.	Cotters—valve.
115.	Circlip—cotter.
116.	Collars—valve spring (bottom).
117.	Shaft.
118.	Plug—plain.
119.	Plug—screwed.
120.	Bracket—tapped hole.
121.	Bracket—plain.
122.	Spring—rocker shaft spacing.
123.	Rocker.
124.	Bush.
125.	Screw—tappet adjusting.
126.	Locknut—screw.
127.	Screw—shaft—locating.
128.	Plate—locking—locating screw
129.	Washer—double coil.
130.	Washer—plain.
131.	Split pin.
132.	Housing—distributor.
133.	Screw—to block.
134.	Screw—distributor to housing.
135.	Washer—spring—screw.
136.	Bracket—dynamo—rear.
137.	Screw—bracket to crankcase.
138.	Washer—spring.
139.	Adjusting link pillar.
140.	Nut—pillar to front plate.
141.	Washer.
142.	Adjusting link.
143.	Washer—plain.
144.	Washer—spring.
145.	Nut—link to pillar.
146.	Washer—spring—link to dynamo.
147.	Screw—link to dynamo.
148.	Bolt—dynamo to bracket.
152.	Liner—front camshaft bearing.
153.	Liner—centre camshaft bearing.
154.	Liner—rear camshaft bearing.
155.	Cover complete—crankcase (front).
156.	Felt ring.
157.	Joint—crankcase front cover.
158.	Set screw—cover to engine plate.
159.	Set screw—cover and plate to bearing cap.
160.	Washer—spring.
161.	Washer—plain.
162.	Set screw—cover and plate to crankcase.
163.	Washer—spring.
164.	Washer—set screw.
165.	Pipe—ignition control.
166.	Clip—pipe.
167.	Nipple.
168.	Nut—carburetter end.
169.	Olive—distributor end.
170.	Nut—distributor end.
171.	Stud—tachometer pinion housing.
172.	Washer—housing stud.
173.	Nut—housing stud.
174.	Washer—dynamo bolt.
175.	Nut—dynamo bolt.
176.	Piston assembly.
177.	Ring—compression—first.
178.	Ring—compression—second and third.
179.	Ring—scraper.
180.	Gudgeon pin.

GENERAL DESCRIPTION

The M.G. (Series MGA) overhead-valve engine is built in unit construction, with an 8 in. (20·3 cm.) single-plate dry clutch.

The valves are set in line in the detachable cylinder head and are operated by rockers and push-rods from the camshaft in the left-hand side of the engine. Oil seals are fitted to the valves and there is the normal provision for clearance adjustment. The camshaft, running in three steel-backed white-metal bearings, is chain-driven and has a synthetic rubber chain silencer. The oil pump, distributor and engine revolution indicator are driven from the camshaft; each component has its own drive shaft.

The solid-skirt pistons are of aluminium alloy with anodized finish, and carry three compression rings and a slotted oil control ring. The gudgeon pins are clamped in connecting rods, which have steel-backed indium-lead renewable big-end bearings. Three steel-backed white-metal renewable bearings support the forged-steel counterbalanced crankshaft. The thrust is taken by special washers at the centre main bearing. The renewable element full-flow oil filter is secured by its centre bolt to the right-hand side of the engine.

A centrifugal water pump and fan are driven from the crankshaft by the dynamo belt.

Two semi-downdraught S.U. carburetters are supplied with fuel by an electric high-pressure S.U. pump. Air enters the carburetters through twin filters.

LUBRICATION SYSTEM

An eccentric-type oil pump inside the crankcase is driven from the camshaft by a short vertical shaft. Oil is drawn into the pump through a gauze strainer and is delivered through crankcase drillings to a non-adjustable plunger-type relief valve located at the rear of the engine on the left-hand side. From the relief valve the oil passes through an internal drilling across the rear of the block and through an external oil pipe to the main oil filter. From the filter the oil passes to the main oil gallery and drillings supply oil to the main, big-end and camshaft bearings. The connecting rod ends are drilled and supply oil to the cylinder walls.

From the rear camshaft bearing oil passes through the block and a drilling in the rear rocker shaft bracket to lubricate the rockers, returning to the sump via the push-rod holes.

Two grooves in the front camshaft journal register with small holes in the camshaft thrust plate as the camshaft turns, allowing a small amount of oil for chain and wheel lubrication to pass into the timing case twice in each revolution of the camshaft. A drain is provided to return oil from the timing case to the sump.

The filter bowl is filled with oil at full pressure which passes through the element into the annular space around the centre bolt and from there into the main oil gallery.

Section A.1

DRAINING THE SUMP

The sump on new and reconditioned engines must be drained and then filled with new oil after the first 500 miles (800 km.) and at intervals of every 3,000 miles (4800 km.). The hexagon-headed drain plug is at the rear of the sump on the right-hand side. The sump should be drained when the engine is hot as the oil will flow more readily; allow to drain for at least 10 minutes before the drain plug is replaced.

Every 6,000 miles (9600 km.) or every alternate oil change remove and wash out the filter bowl before filling the sump with new oil. Fit a new filter element and replace the bowl.

When the sump has been drained, approximately 7½ pints (9 U.S. pints, 4·26 litres) of oil are required to fill it.

The capacity of the filter is approximately ½ pint (·6 U.S. pint, ·28 litre), giving a total of 8 pints (9·6 U.S. pints, 4·54 litres).

Section A.2

OIL PRESSURE

Under normal running conditions the oil pressure should not drop below 30 lb./sq. in. (2·1 kg./cm.²) on the gauge at normal road speeds, whilst approximately 10 lb./sq. in. (·7 kg./cm.²) should be shown when the engine is idling. New engines with new oil will give considerably higher readings at low speeds.

Should there be a noticeable drop in pressure, the following points should be checked:

(1) That there is a good supply of the correct grade of oil in the engine sump.

(2) That the strainer in the sump is clean and not choked with sludge.

(3) That the bearings, to which oil is fed under pressure, have the correct working clearances. Should the bearings be worn and the clearances excessive, the oil will escape more readily from the sides of the bearings, particularly when the oil is warm and becomes more fluid. This will cause a drop in pressure on the gauge as compared with that shown when the bearings are in good order.

The automatic relief valve in the lubrication system deals with any excessive oil pressure when starting from cold. When hot the pressure drops as the oil becomes more fluid.

THE M.G. (Series MGA) ENGINE