MGB TOURER AND GT

Special Tuning

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British Leyland Special Tuning Department

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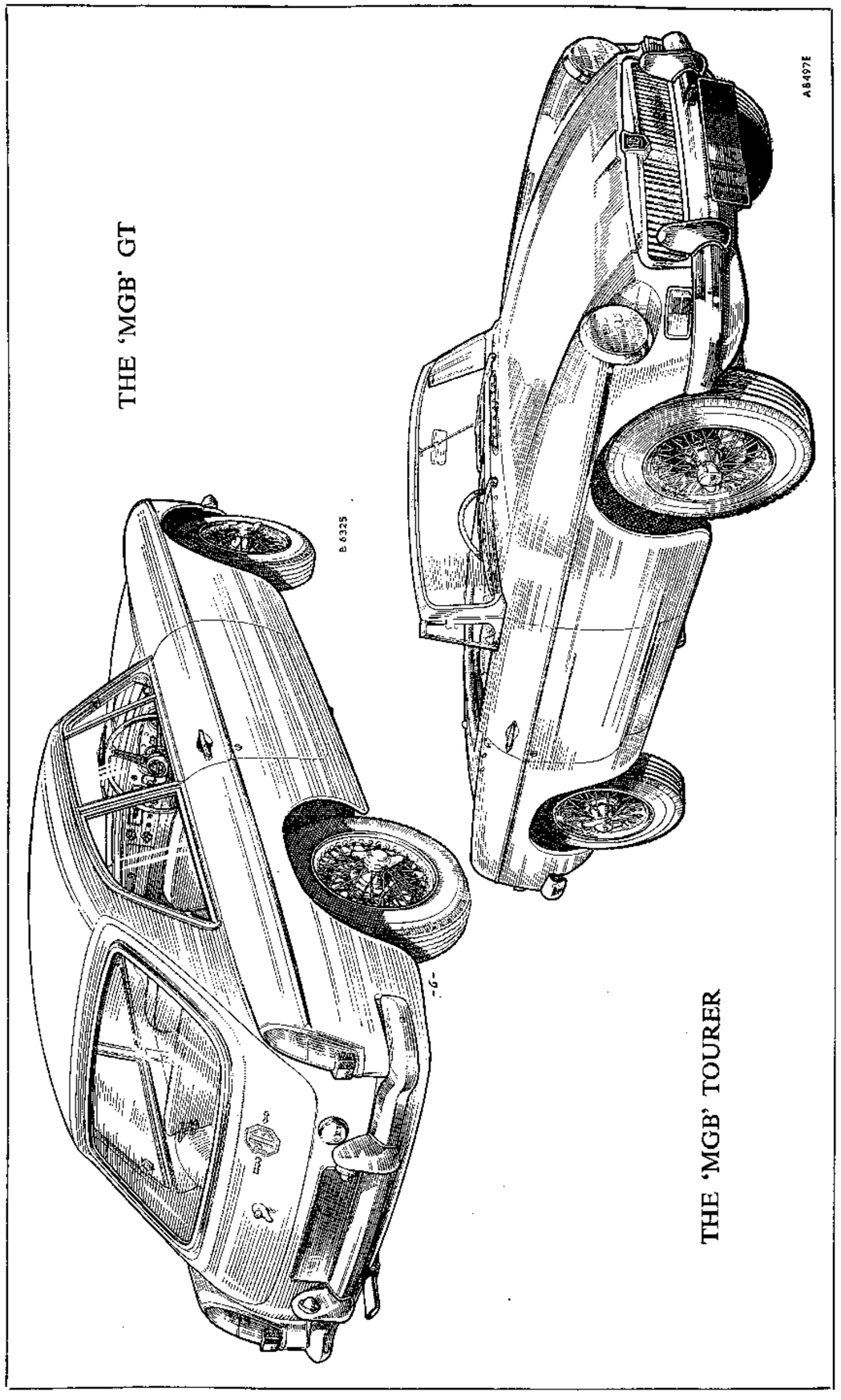

FOREWORD

This is another of the M.G. Tuning Booklets which have been issued in recent years. It deals specifically with the Series MGB.

The 'MGB' as delivered from the Factory in its standard form is tuned to give maximum performance with 100-octane gasoline consistent with complete reliability and reasonable freedom from pinking. There is, however, a more or less continuous demand from enthusiasts all over the world for information on methods of improving the performance for competitive purposes, and it is to meet this demand that this booklet has been prepared.

It must be clearly understood, however, that, whereas it is a simple matter to increase the power output of the engine, this increase in power must inevitably carry with it a tendency to reduce reliability. It is for this reason that the terms of the Warranty on a new M.G. expressly exclude any super-tuning of the kind described in this booklet, but this does not mean that tuning in this way will necessarily make the car hopelessly unreliable. In fact, it may be assumed that it will be at least as reliable as other cars of similar performance.

This booklet is laid out to give details for progressively increasing the power. With the above ideas firmly in mind, the owner should select the simplest tuning method which will give him the performance he requires, remembering all the time that here, as elsewhere, **Power Costs Money.**

Tuning hints are included for the racing enthusiasts who want to go to the limit and who have facilities to modify or make up special parts for their cars. We hope this section will be of use to them.

Owners are reminded that in certain countries noise restriction regulations are in force. The Company cannot therefore accept responsibility for any increase in the existing noise level of the car which may result after special tuning operations have been carried out. In Countries with air pollution regulations, modifications to the engine may prohibit the car from use on public roads.

Most competitive events are run under rules agreed by the F.I.A. which limit modifications for certain groups or categories. As soon as improvements are incorporated into production or become available as special parts, the necessary steps are taken to have these parts approved for competition and included on the homologation forms.

However, whilst every care is taken, no responsibility can be accepted for ensuring that any specifications or modifications comply with the F.I.A. Regulations or homologation forms. Copies of the forms of recognition are available **only** from the **R.A.C.** Competitions Department, 31 Belgrave Square, London S.W.1., who will also be able to advise on any queries concerning eligibility of modified cars.

Note.—All parts mentioned must be obtained through your BMC Distributor or Dealer. Ensure that the full part number is quoted.

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GETTING THE BEST FROM YOUR 'MGB'

When fitted with a H.C. engine (compression ratio 8·8 : 1)

The engine fitted to your 'MGB' is a highly developed unit and it is essential that you should know something about the specialized maintenance it requires if you are to maintain it at the peak of its mechanical efficiency.

Special recommendations on the sparking plugs, ignition settings, and fuel to be used are given by the manufacturers, and it is stressed that failures are bound to occur if these are not strictly adhered to. Particular care is needed with this engine owing to its high compression ratio, which makes it extremely sensitive to variations in fuel, ignition timing, and the heat range of the sparking plugs.

In lower compression engines a much wider range of fuels can be tolerated without causing serious damage to the engine, and ignition settings will stand variations of a reasonable amount. Also, even if the incorrect sparking plugs are used, no more damage may be incurred than burnt-out plugs or leaky valves. But with an engine having a very high compression ratio the range of fuels, sparking plugs, and ignition settings is much narrower and it is essential that the mixture should always be correct, and particularly never overweak at maximum load or power.

High-compression engines are very sensitive to variations in spark advance (over-advance) and to fuel/air ratio (mixture). Variations in these settings will increase the combustion temperature, and if the variation is excessive pre-ignition will cause high shock waves, resulting in damage to the engine. The engine should be decarbonized at regular intervals as excessive deposits of ash from the combustion of lubricating oil and fuel can cause pre-ignition difficulties.

Workshop Manual

A comprehensive Workshop Manual, Part No. AKD 3259 F, is available, and should be used in conjunction with this booklet.

Choice of fuel

When fitted with H.C. engine (*compression ratio* 8·8 : 1)

The octane number of a motor fuel is an indication given by the fuel technicians of its knock resistance. High-octane fuels have been produced to improve the efficiency of engines by allowing them to operate on high compression ratios, resulting in better fuel economy and greater power. Owing to the high compression ratio of the 'MGB' engines, fuels with an octane rating below 98 are not suitable; should it be necessary to use a fuel with a lower octane number, the car must be used very carefully until the correct fuel can be obtained.

It is necessary to use Super grade fuels in the 100-octane range unless Premium fuels of minimum 98-octane Research are available.

When fitted with L.C. engine (*compression ratio* 8·0 : 1)

Premium fuels of minimum 93-octane Research up to 97 octane are required, with preference to 95/97.

Super grade fuels in the 100-octane range can be used if preferred.

Sparking plugs

The correct grade of sparking plug for use under normal driving conditions is the Champion N-9Y. Plugs of a lower heat range (hotter running) should not be used, otherwise pre-ignition will occur, with consequent rise in combustion

temperature and resulting engine damage. For competition work or hard driving where high output is consistently sustained the Champion N3 sparking plug should be used. This is a cooler-running plug and will ensure lower combustion temperatures and an increased margin of safety. Accumulated deposits of carbon, leaking or cracked insulators, and thin electrodes are all causes of pre-ignition. The plugs should therefore be examined, cleaned, and adjusted at the specified intervals and defective ones renewed. New plugs should be fitted every 12,000 miles (20000 km.).

Static ignition settings

It is of the utmost importance that the correct setting should always be maintained. It will be appreciated that any variation in the contact breaker gap will affect the ignition setting, and your particular attention is called to the 6,000 miles (10000 km.) check and adjustment of the distributor points specified in the Driver's Handbook. After adjusting the contact breaker gap to the correct setting it is advisable to check the ignition timing, and to correct it if necessary.

An accurate check can be carried out by a very simple electrical method. To do this, connect a 12-volt lamp between the low-tension terminal on the side of the distributor and a good earth point on the engine.

With the ignition switched on and the sparking plugs removed, turn the crankshaft until the crankshaft pulley pointer is exactly at the correct number of degrees as stated under **'GENERAL DATA'**.

If the ignition timing is correct the lamp will light at exactly this point. Any discrepancy in the ignition setting can be rectified by turning the vernier adjusting nut on the distributor until the test lamp lights at exactly the correct setting. If pinking should occur due to the use of a fuel of a lower range than our recommendations, retarding the ignition 2 to 3° can be tolerated. In no circumstances should the ignition be advanced beyond the correct setting.

Dunlop centre-lock wheel

This is built on the Rudge-Whitworth system and provides the most rapid method of changing road wheels. Like all mechanical devices, it must be properly treated in order to give 100 per cent. service.

Observation of the following quite simple hints will ensure complete satisfaction.

When the car is new. After the first long run, or after 50 miles (80 km.) of short runs, jack up each wheel and hammer the nuts to ensure that they are tight.

When wheels are replaced, cover both conical surfaces and the serrations in the hub, also the coned surface and threads in the locknut, with a light coating of grease. Hammer tight and repeat as when car is new.

When a forced change is made on the road, remove and grease the hub as soon as convenient.

Once in 12 months remove the wheels for examination and regreasing.

When changing wheels wipe the serrations and cones on the hub, wheel, and locknut to remove any foreign matter that would prevent the wheel from properly seating. Rust and dirt are the enemies of all mechanical devices.

After a general overhaul of the car, which may involve stripping of the axle, the inscription on the locknuts should be checked to see that it corresponds with the side of the car on which it is applied.

General.—Always hammer the locknuts tight. Lift the car on the jack before using the hammer. The locknuts are designed for self-locking, but they should not on that account be permitted to run untightened, because there is, in such case, a possibility of damaging the splines.

Electrical system

After Car No. 151915, all cars were changed to NEGATIVE EARTH. When fitting polarity-conscious electrical equipment ensure that it is NEGATIVE EARTH.

GENERAL DATA

Engine

Type	18G/18GA (3 main bearing) 18GB (5 main bearing)
Number of cylinders ..	4
Bore	3·16 in. (80·26 mm.)
Stroke	3·5 in. (89 mm.)
Capacity	1798 c.c. (109·8 cu. in.)
Firing order	1, 3, 4, 2
Compression ratio	H.C. 8·8 : 1 (L.C. 8 : 1)
Capacity of combustion chamber (valves fitted) ..	42·5 to 43·5 c.c. (2·59 to 2·65 cu. in.)
Valve operation	Overhead by push-rod
Safe maximum r.p.m. ..	6,000
Valve crash r.p.m.	6,230
B.H.P.	H.C. 95 (L.C. 91) at 5,400
B.M.E.P.	152 at 3,100
Torque (lb. ft.)	
H.C.	110 (15·2 kg. m.) at 3,000 r.p.m.
L.C.	105 (14·5 kg. m.) at 3,000 r.p.m.
Octane rating	Minimum requirements for knock-free operation. H.C. 98+, L.C. 93+
Cooling system	Thermo-siphon, pump- and fan-assisted
Oversize bore	
First	·010 in. (·254 mm.)
Maximum	·040 in. (1·016 mm.)

Crankshaft

Main journal diameter ..	2·126 to 2·127 in. (54·01 to 54·02 mm.)
Minimum regrind diameter..	2·086 in. (52·984 mm.)
Crankpin journal diameter..	1·8759 to 1·8764 in. (47·65 to 47·66 mm.)
Crankpin minimum regrind diameter	1·8359 in. (46·64 mm.)

Main bearings

Number and type	18G/18GA—3 thinwall, 18GB—5 thinwall
Material	
Bottom half	Steel-backed copper-lead
Top half	Steel-backed copper-lead
Length	
Front, centre, and rear ..	1·125 in. (28·575 mm.)
Intermediates (18GB only)	·785 in. (22·23 mm.)
End-clearance	·002 to ·003 in. (·051 to ·076 mm.)
End-thrust	Taken by thrust washers at centre main bearing
Running clearance	·001 to ·0027 in. (·025 to ·0688 mm.)

Connecting rods

Type	Angular-split big-end
18G/18GA	Split clamp small end
18GB	Bush small end
Length between centres ..	6·5 in. (165·1 mm.)
Big-end bearings	
Material top half ..	Steel-backed copper-lead
Material bottom half ..	Steel-backed copper-lead
Bearing side-clearance ..	·008 to ·012 in. (·203 to ·305 mm.)
Bearing diametrical clearance	·001 to ·0027 in. (·025 to ·0688 mm.)
Gudgeon pin bore (18GB)	·8126 to ·8129 in. (19·68 to 19·95 mm.)

Pistons

Type	Aluminium alloy
Clearances	
Bottom of skirt	·0018 to ·0024 in. (·045 to ·060 mm.)
Top of skirt	·0036 to ·0048 in. (·091 to ·121 mm.)
Oversizes	+·010 in., +·020 in. +·030 in., +·040 in. (+·254 mm., +·508 mm., +·762 mm., +1·016 mm.)

Piston rings

Compression: Plain ..	Top ring (chrome-plated)
Tapered ..	Second and third rings
Width	·0615 to ·0625 in. (1·56 to 1·58 mm.)
Thickness	·137 in. (3·48 mm.)
Fitted gap	·012 to ·017 in. (·304 to ·431 mm.)
Clearance in groove ..	·0015 to ·0035 in. (·038 to ·089 mm.)
Oil control ring	Slotted scraper
Width	·1552 to ·1562 in. (3·94 to 3·99 mm.)
Thickness	·137 in. (3·48 mm.)
Fitted gap	·012 to ·017 in. (·304 to ·431 mm.)
Clearance in groove ..	·0016 to ·0036 in. (·040 to ·091 mm.)

Gudgeon pin

18G/18GA	
Type	Clamped
Fit (in piston)	Free fit to 20° C. (68° F.)
Diameter	·75 in. (19·05 mm.)
18GB	
Type	Fully floating
Fit (in piston)	·0001 in. to ·00035 in. (·0025 to ·007 mm.)
Fit (in bush)	Hand push

Cylinder head

Cylinder head depth ..	$3\frac{11}{64}$ $^{+\cdot015\text{ in.}}_{-\cdot000\text{ in.}}$ ($80{\cdot}6$ $^{+\cdot400\text{ mm.}}_{-\cdot000\text{ mm.}}$)
Thickness of cylinder head gasket	·023 in. (·584 mm.) compressed
Capacity of cylinder head gasket	3·208 c.c.
Capacity of combustion space	42·5/43·5 c.c. (valves fitted)
Capacity of piston head below block face	H.C. 10·87 c.c. (L.C. 17·43 c.c.)
(including capacity of piston concavity)	H.C. 6·25 c.c. (L.C. 12·8 c.c.)
Capacity of plug centre hole	·2 c.c
Inlet and exhaust manifold gasket	Part No. 1G 2417
Valve seat angle in cylinder head	45°

Valves and valve gear

Seat angle	
Inlet and exhaust ..	45½° (seat angle in cylinder head 45°)
Head diameter	
Inlet	1·562 to 1·567 in. (38·67 to 38·8 mm.)
Exhaust	1·343 to 1·348 in. (34·11 to 34·23 mm.)
Stem diameter	
Inlet	·3422 to ·3427 in. (8·692 to 8·709 mm.)
Exhaust	·34175 to ·34225 in. (8·680 to 8·693 mm.)
Valve lift (clearance set ·015 in.)	·3645 in. (9·26 mm.)
Cam lift	·250 in. (6·35 mm.)
Throat diameter	
Inlet	1·3125 in. (33·33 mm.)
Exhaust	1·156 in. (29·36 mm.)
Valve stem to guide clearance	
Inlet	·00155 to ·00255 in. (·0394 to ·0648 mm.)
Exhaust	·00200 to ·00300 in. (·051 to ·076 mm.)
Valve rocker clearance	
Running	·015 in. (·38 mm.) cold
Timing	
Inlet and exhaust ..	·021 in. (·53 mm.)
Timing markings	Dimples on timing wheels
Chain pitch and number of pitches	⅜ in. (9·52 mm.), 52 pitches

Valves and valve gear—*continued*

Inlet valve	
Opens	16° B.T.D.C.
Closes	56° A.B.D.C.
Exhaust valve	
Opens	51° B.B.D.C.
Closes	21° A.T.D.C.

Valve guides

	Early cars	*Later cars*
Length		
Inlet	$1\frac{5}{8}$ in. (41·275 mm.)	$1\frac{7}{8}$ in. (47·63 mm.)
Exhaust	$2\frac{13}{64}$ in. (56·96 mm.)	$2\frac{13}{64}$ in. (56·96 mm.)
Diameter		
Inlet and exhaust		
Outside	·5635 to ·5640 in. (14·3129 to 14·3256 mm.)	
Inside	·34425 to ·34475 in. (8·74269 to 8·75665 mm.)	
Fitted height above head ..	·625 in. (15·87 mm.) short inlet guides	
Fitted height above head ..	·75 in. (19 mm.) longer inlet guides	

Valve springs

Free length	
Inner	$1\frac{31}{32}$ in. (50 mm.)
Outer	$2\frac{9}{64}$ in. (54·372 mm.)
Fitted length	
Inner	$1\frac{7}{16}$ in. (36·51 mm.)
Outer	$1\frac{9}{16}$ in. (39·69 mm.)
Number of working coils	
Inner	$6\frac{1}{2}$
Outer	$4\frac{1}{2}$
Pressure	
Valve open	Inner 50 lb. (22·7 kg.)
	Outer 117 lb. (53·08 kg.)
Valve closed	Inner 30 lb. (13·6 kg.)
	Outer $72\frac{1}{2}$ lb. (32·89 kg.)

Tappets

Type	Flat base. Barrel type
Diameter	
Body	$\frac{13}{16}$ in. (20·64 mm.)
Working face	$\frac{9}{16}$ in. (14·29 mm.)
Length	2·293 to 2·303 in. (58·25 to 58·5 mm.)

Rockers

Outside diameter (before fitting)	·751 in. (19·07 mm.)
Inside diameter (reamed in position)	·616 to ·620 in. (15·65 to 15·74 mm.)
Bore of rocker arms	·7485 to ·7495 in. (19·01 to 19·04 mm.)
Rocker ratio	1·426 : 1

Camshaft

Journal diameters	
Front	1·78875 to 1·78925 in. (45·43 to 45·44 mm.)
Centre	1·72875 to 1·72925 in. (43·91 to 43·92 mm.)
Rear	1·62275 to 1·62325 in. (41·22 to 41·23 mm.)
End-float	·003 to ·007 in. (·076 to ·178 mm.)
Bearings—number and type	3. Thinwall steel-backed copper-lead
Outside diameter (before fitting)	
Front	1·920 in. (48·76 mm.)
Centre	1·860 in. (47·24 mm.)
Rear	1·754 in. (44·55 mm.)
Inside diameter (reamed in position)	
Front	1·79025 to 1·79075 in. (45·472 to 45·485 mm.)
Centre	1·73025 to 1·73075 in. (43·948 to 43·961 mm.)
Rear	1·62425 to 1·62475 in. (41·256 to 41·269 mm.)
Diametrical clearance	·001 to ·002 in. (·0254 to ·0508 mm.)

Engine lubrication system

Oil pump	
Type	Eccentric rotor
Relief pressure valve operates	70 lb./sq. in. (4·9 kg./cm.²)
Relief valve spring	
Free length	3 in. (76·2 mm.)
Fitted length	2 5/32 in. (54·77 mm.) at 16 lb. (7·26 kg.) load
Identification colour	Red spot
Oil filter	
Type	Tecalemit
Capacity	½ pint (·6 U.S. pint, ·28 litre)
Oil pressure	
Normal running	
Minimum	10 lb./sq. in. (·7 kg./cm.²)
Maximum	80 lb./sq. in. (5·6 kg./cm.²)

Torque wrench settings

Cylinder head nuts	45–50 lb. ft. (6·2–6·9 kg. m.)
Main bearing nuts	70 lb. ft. (9·7 kg. m.)
Connecting rod set screws	40–45 lb. ft. (5·5–6·2 kg. m.)
Clutch assembly to flywheel	25–30 lb. ft. (3·45–4·1 kg. m.)
Flywheel bolts	40 lb. ft. (5·5 kg. m.)
Gudgeon pin set screws	25 lb. ft. (3·45 kg. m.)

Fuel system

Carburetter	
Make and type	S.U. twin HS4 semi-downdraught
Diameter	1½ in. (38·1 mm.)
Needle	No. 5 (standard), No. 6 (rich), No. 21 (weak)
Jet	·090 in. (2·29 mm.)
Carburetter piston	Part No. AUC 2061
Piston spring	Red (Part No. AUC 4387)

Air cleaner

Make and type	Coopers Mechanical Joints Ltd., Steel canister, paper element (replaceable)

Fuel pump

Make and type	S.U. electric, high-pressure
Delivery test	10 gal. per hr. (12 U.S. gal., 45·4 litres per hr.)
Suction lift	33 in. (83·8 cm.)
Output lift	48 in. (121·9 cm.)

Cooling system

Type	Pressurized radiator, thermo-siphon, pump- and fan-assisted
Filler cap spring pressure	7 lb. (3·175 kg.)

Ignition system

Sparking plugs	Champion N-9Y
Size	14 mm.
Plug gap	·024 to ·026 in. (·61 to ·66 mm.)
Coil	Lucas HA12
Distributor	Lucas, Type 25D4
Distributor contact points gap	·014 to ·016 in. (·35 to ·40 mm.)
Suppressors type	Lucas No. 78106A fitted on each H.T. cable
Timing	H.C. 10° B.T.D.C. (L.C. 8° B.T.D.C.)

Clutch

Make and type	Borg & Beck 8 in. (20·3 cm.) diaphragm spring. Strap drive
Diameter	8 in. (20·3 cm.)
Facing material	Wound yarn—Borglite
Damper springs	6
Colour	Black/light green

Gearbox (Standard and Overdrive) 18G/18GA/18GB

Number of forward speeds	4
Synchromesh	Second, third, and fourth gears
Overdrive	·802

Ratios

Top	1·0000 : 1
Third	1·3736 : 1
Second	2·2143 : 1
First	3·6363 : 1
Reverse	4·7552 : 1

Overall ratios		*M.p.h. per* 1,000 *r.p.m.*
Overdrive	3·135 : 1	22·3
Top	3·909 : 1	17·9
Third	5·36 : 1	13·09
Second	8·65 : 1	8·11
First	14·20 : 1	4·94
Reverse	18·60 : 1	3·77

Speedometer gears ratio .. 9 : 28 (overdrive 5 : 16)

Optional axle ratios	*Overall ratios*	*M.p.h. per* 1,000 *r.p.m.*
Overdrive	3·649 : 1	19·2
Top	4·55 : 1	15·4
Third	6·24 : 1	11·24
Second	9·98 : 1	7·03
First	16·54 : 1	4·24
Reverse	21·63 : 1	3·24
Overdrive	3·449 : 1	20·3
Top	4·3 : 1	16·3
Third	5·9 : 1	11·89
Second	9·52 : 1	7·37
First	15·63 : 1	4·4
Reverse	20·44 : 1	3·43
Overdrive	3·288 : 1	21·3
Top	4·1 : 1	17·1
Third	5·63 : 1	12·44
Second	9·07 : 1	7·73
First	14·90 : 1	4·70
Reverse	19·49 : 1	3·60

Gearbox (Standard and Overdrive) 18GD onwards

Number of forward gears	4
Synchromesh	All forward gears

Gearbox ratios

Reverse	3·095 : 1
First	3·44 : 1
Second	2·167 : 1
Third	1·382 : 1
Fourth	1·000 : 1

Overdrive:

Type	Laycock L.H.
Ratio	·82 : 1

Overall gear ratios		*Overdrive*
Reverse	12·098 : 1	
First	13·45 : 1	
Second	8·47 : 1	
Third	5·4 : 1	4·43 : 1
Fourth	3·909 : 1	3·2 : 1

Top gear speed per 1,000 r.p.m.

Standard	18 m.p.h. (29 km.p.h.)
Overdrive	22 m.p.h. (35 km.p.h.)

Speedometer gear ratio

Standard	10 : 26
Overdrive	8 : 21

Gearbox (close-ratio) (Not suitable for 18GD or 18GF models)

Number of forward speeds	4
Synchromesh	Second, third, and fourth gears
Overdrive ratio	·82

Ratios

Top	1·0 : 1
Third	1·268 : 1
Second	1·620 : 1
First	2·450 : 1
Reverse	4·7552 : 1

Overall ratios		*M.p.h. per* 1,000 *r.p.m.*
Overdrive	3·135 : 1	22·3
Top	3·909 : 1	17·9
Third	4·956 : 1	14·1
Second	6·332 : 1	11·0
First	9·577 : 1	7·3
Reverse	18·588 : 1	3·7

Gearbox (close-ratio)—*continued*

		Overall ratios	*M.p.h. per* 1,000 *r.p.m.*
Speedometer gears ratio	..	9 : 28 (Overdrive 5 : 16)	
Optional axle ratios			
Overdrive	..	3·649 : 1	19·2
Top	..	4·55 : 1	15·4
Third	..	5·769 : 1	12·1
Second	..	7·371 : 1	9·5
First	..	11·147 : 1	6·3
Reverse	..	21·635 : 1	3·2
Overdrive	..	3·449 : 1	20·3
Top	..	4·30 : 1	16·3
Third	..	5·452 : 1	12·8
Second	..	6·966 : 1	10·0
First	..	10·535 : 1	6·6
Reverse	..	20·447 : 1	3·4
Overdrive	..	3·288 : 1	21·3
Top	..	4·10 : 1	17·1
Third	..	5·198 : 1	13·4
Second	..	6·642 : 1	10·5
First	..	10·045 : 1	7·0
Reverse	..	19·496 : 1	3·6

Steering

Type	..	Rack and pinion
Steering-wheel		
Turns—lock to lock	..	2·93
Diameter	..	16½ in. (41·9 cm.)
Camber angle	..	Front 1°
Castor angle	..	7°
King-pin inclination	..	8°
Toe-in	..	$\frac{1}{16}$ to $\frac{3}{32}$ in. (1·6 to 2·4 mm.)
Track: Front	..	Disc wheels 49 in. (1·244 m.)
		Wire wheels 49¼ in. (1·251 m.)
Rear	..	Disc wheels 49¼ in. (1·251 m.)
		Wire wheels 49¼ in. (1·251 m.)

Front suspension		**Tourer**	**GT**
Type	..	Independent coil	
Spring detail			
Coil diameter (mean)	..	3·238 in. (82·23 mm.)	3·28 in. (83·5 mm.)
Diameter of wire	..	·498 in. (12·66 mm.)	·54 in. (14 mm.)
Free height	..	9·9 ± $\frac{1}{16}$ in. (251 mm. ±1·6 mm.)	9·1 ± $\frac{1}{16}$ in. (231 ±1·6 mm.)
Number of free coils	..	7·5	7·2
Static laden length	..	7 ± $\frac{1}{32}$ in. (178 mm. ±·8 mm.) at load of 1,030 lb. (467·2 kg.)	6·6 in. (168 mm.) at load of 1,193 lb. (541·5 kg.) ±20 lb. (9·1 kg.)
Dampers (front)	..	Piston type	
Anti-roll bar (front)	..	$\frac{9}{16}$ in. (14·3 mm.) dia. standard	$\frac{5}{8}$ in. (15·9 mm.) dia. standard

Rear suspension

		Tourer (*Early type*)	*Tourer* (*Later type*)
Type	..	Semi-elliptic	
Spring detail			
Number of leaves	..	5 and bottom plate	6 and bottom plate
Width of leaves	..	1¾ in. (44·45 mm.)	1¾ in. (44·45 mm.)
Gauge	..	$\frac{7}{32}$ in. (5·56 mm.)	3 at $\frac{7}{32}$ in. (5·6 mm.), 3 at $\frac{3}{16}$ in. (4·8 mm.)
Working load (−15 lb. [7 kg.])		400 lb. (181·44 kg.)	450 lb. (204·12 kg.)
		GT 510 lb. (321·6 kg.)	
Dampers (rear)	..	Piston type	

Propeller shaft

Type	..	Tubular flanged 1100 series
Make and type of joints	..	Hardy Spicer, needle roller
Propeller shaft length (between centres of joints)	..	27⅝ in. (70·167 cm.) standard
		28¾ in. (73·025 cm.) overdrive
Overall length	..	30 in. (76·2 cm.) standard
		31⅛ in. (79·057 cm.) overdrive
Diameter	..	2 in. (50·8 mm.)

Rear axle		*Tourer* (*Early*)	*Tourer* (*Later*) *and GT*
Type	..	'B' type, three-quarter-floating	'Tubed' type, semi-floating
Ratio			
Standard	..	11/43	11/43
Alternatives	..	9/41, 10/43, 10/41	9/38, 9/41
Adjustment	..	Shims	

Electrical equipment

System	..	12-volt. Positive earth early cars; negative earth from Car No. 151915
Charging system	..	Compensated voltage control
Battery	..	Two 6-volt Lucas SG9E
Starter motor	..	Lucas 4-brush M418G
Dynamo	..	Lucas C40/1
Alternator	..	Lucas type 16ACR

Brakes

Type	..	Lockheed hydraulic (front and rear)
Front	..	Disc 10¾ in. dia. (27·3 cm.)
Rear	..	Drum 10 in. (25·4 cm.), single leading shoe
Rear linings	..	10 in. × 1¾ in. (25·4 cm. × 44·45 mm.)
Lining dimensions	..	9·6 in. × 1¾ in. (24·38 cm. × 44·45 mm.)
Lining area		
Front pads	..	20 sq. in. (129·03 cm.²) total
Rear	..	67·2 sq. in. (433·55 cm.²)

Brakes—*continued*

Material	
Front	DON 55
Rear	DON 24
Brake cylinder diameter	
Front	2⅛ in. (53·97 mm.) dia.
Rear	·80 in. (20·32 mm.) dia.

Wheels

Type	*Tourer*	*GT*
Ventilated disc	4J × 14 in.	5J × 14 in.
Wire (optional)	4½J × 14 in. and 60-spoke (Tourer and GT)	

Tyres

Standard		
Size	5·60—14 (Tubed C.41)	
Optional	*Tourer*	*GT*
Size	155—14 (SP)	165—14 (SP)
Standard tyres		
Pressures (set cold)	*Tourer*	*GT*
Front	18 lb./sq. in. (1·3 kg./cm.²)	20 lb./sq. in. (1·4 kg./cm.²)
Rear	18 lb./sq. in. (1·3 kg./cm.²)	24 lb./sq. in. (1·7 kg./cm.²)
Sustained speeds in excess of 90 m.p.h. (145 km.p.h.):		
Front	24 lb./sq. in. (1·7 kg./cm.²)	26 lb./sq. in. (1·8 kg./cm.²)
Rear	24 lb./sq. in. (1·7 kg./cm.²)	30 lb./sq. in. (2·1 kg./cm.²)
Optional tyres (SP)		
Pressures (set cold)	*Tourer*	*GT*
Front	21 lb./sq. in. (1·5 kg./cm.²)	21 lb./sq. in. (1·5 kg./cm.²)
Rear	24 lb./sq. in. (1·7 kg./cm.²)	24 lb./sq. in. (1·7 kg./cm.²)
Sustained speeds in excess of 90 m.p.h. (145 km.p.h.):		
Front	27 lb./sq. in. (1·9 kg./cm.²)	28 lb./sq. in. (2·0 kg./cm.²)
Rear	31 lb./sq. in. (2·2 kg./cm.²)	31 lb./sq. in. (2·2 kg./cm.²)

Note.—Rear tyre pressures may be increased by 2 lb./sq. in. (·14 kg./cm.²) with advantage when touring with a laden boot.

For competition work and use of racing tyres, advice may be obtained direct from the Dunlop Rubber Co. Ltd., Fort Dunlop, Erdington, Birmingham 24.

Capacities	*Imp.*	*U.S.A.*	*Litres*
Engine sump (incl. filter) ..	7½ pts.	9 pts.	4·28
Gearbox	5½ pts.	6¾ pts.	3·12
Rear axle	2¾ pts.	3¼ pts.	1·56
Cooling system (with heater)	10 pts.	12 pts.	5·67
Steering rack	⅛ pt.	·39 pt.	·19
Fuel tank			
Early cars	10 gal.	12 gal.	45·4
Later cars	12 gal.	14 gal.	54·5
Brake system	1 pt.	1·2 pt.	·568
Oil cooler	¾ pt.	·9 pt.	·42

General dimensions

Wheelbase	91 in. (231·14 cm.)	
Over-all length	153 3/16 in. (389·13 cm.)	
Over-all width	59 15/16 in. (152·28 cm.)	
Over-all height	49⅜ in. (125·41 cm.)	
Ground clearance	5 in. (12·70 cm.)	
Weight:	*Tourer*	*GT*
(Unladen)	1,920 lb. (871 kg.)	2,190 lb. (993 kg.)
Turning circles	32 ft. (9·754 m.)	

TUNING

Stage 1

Tuning by port polishing (ordinary road work)

An increase of some 3 b.h.p. can be had by general attention to the cylinder head and port polishing as detailed below.

Lightly grind and polish the exhaust and inlet ports throughout. They should not be ground out so heavily that the shape or valve choke diameters are impaired, as the wall between the exhaust and inlet valves may become too thin and cause valve seat cracking.

Just inside the ports, at the bridge between the exhaust and inlet valve seats, you will notice a protuberance; do not grind too much of this away, as this is the port wall, where the water cooling has been brought down as close to the valve seats as possible.

Grind out the combustion spaces, but only very lightly, as these are already quite clean and partly machined; remove any frazes and lightly polish all over. It is most important that no enlargement around the combustion walls takes place as this may cause the cylinder head gasket to overlap. This will destroy the efficiency of the seal, lower the compression ratio, and cause tuning to be ineffective.

The combustion space and ports are already highly developed from a flow angle aspect, and it will be found difficult to improve by reshaping or enlarging. The main requirement is to obtain the highest polish, but to remove the minimum amount of metal.

Match up, by grinding, all the exhaust and inlet manifold ports with the cylinder head ports.

Grind out and polish the inlet manifold, also matching the carburetter bore. Make the bore of the manifold a gradual taper from the carburetter end to the cylinder head port, grinding away any ridges left by machining during manufacture.

Distributor setting as standard.

If your existing cylinder head is worn out by continual recutting of the valve seats or is damaged in any way, a fully polished head, complete with valves and stronger springs, is available (Part No. C–AHT 100). There is no factory exchange scheme for your original head, which remains your property.

Stage 2

Tuning for middle-range acceleration (ordinary road work)

If most importance is placed on initial and middle-range acceleration an improvement of 2 or 3 b.h.p. may be gained in the lower ranges by fitting camshaft Part No. 48G 184. This has the timing: inlet opens T.D.C., inlet closes 50° A.B.D.C., exhaust opens 35° B.B.D.C., exhaust closes 15° A.T.D.C.

The valve lift is ·322 in. (8·2 mm.), and cam lift is ·216 in. (5·7 mm.).

Top end performance will only be slightly impaired between 5,000 and 6,000 r.p.m.

If desired, the head may be tuned by port polishing as laid down in Stage 1.

Distributor setting as standard.

Stage 3

Compression ratio 9·6 to 9·8 : 1 (competition tune)

Carry out Stage 1, or use polished head C–AHT 100.

Fit a competition (half-race) camshaft (Part No. C–AEH 714). This gives ·250 in. (6·35 mm.) cam lift with a 268° period for inlet and exhaust. Inlet opens 24° B.T.D.C. and closes 64° A.B.D.C. Exhaust opens 59° B.B.D.C. and closes 29° A.T.D.C., check that the camshaft identification ring does not foul the connecting rod.

Tappet setting ·017 in. (·43 mm.) hot. For valve springs see page 27.

Machine $\frac{1}{16}$ in. (1·59 mm.) from the cylinder head face to raise the compression ratio to 9·7 : 1. The head thickness will then be $3\frac{7}{64}$ $^{+\cdot015}_{-\cdot000}$ in. ($79\ ^{+\cdot38}_{-\cdot000}$ mm.).

Fit $1\frac{3}{4}$ in. (44·45 mm.) diameter S.U. carburetters (Part No. C–AUD 229 for a pair); these are fitted with ·100 jets, SY needles, and light blue springs. The carburetters can be fitted to the standard manifold, which should be polished as explained in Stage 1.

All necessary parts and instructions for fitting these carburetters are included in kit Part No. C–AJJ 3321.

No air cleaners are arranged for these carburetters, but extension pipes Part No. C–AHH 7209, to reduce the turbulence at the carburetter mouth, are included in the installation kit.

Check the valves at full lift to ensure that the exhaust valves do not foul the top face of the cylinder block; if so, the block must be undercut to clear the valve head and give a minimum lift clearance of $\frac{1}{16}$ in. (1·59 mm.). Use a $1\frac{17}{32}$ in. dia. flat cutter with a $\frac{1}{16}$ in. (1·59 mm.) radius at the corner of the cutter.

The engine should give 105/108 b.h.p. at 6,000 r.p.m.

The static setting for the standard distributor should be 10° B.T.D.C.

Stage 3A

Compression ratio 9·6 to 9·8 : 1 (competition tune)

As Stage 3, but alternative to machining the cylinder head, as Stage 3, the compression ratio may be raised by fitting the flat top competition pistons (as detailed in Stage 4).

Stage 3B

Compression ratio 10·5 : 1 (competition tune)

If you carry out Stage 3A the compression ratio can be raised to 10·5 : 1 by machining $\frac{1}{16}$ in. (1·59 mm.) from the cylinder head face (as detailed in Stage 3).

The engine should develop 112/115 b.h.p. at 6,000 r.p.m.

Stage 4
Compression ratio 9·6 to 9·8 : 1 (competition tune)

Polish the head as Stage 1.

Standard valves and guides may be used successfully, but for consistent performance fit bronze Hidural inlet and exhaust valve guides and high-duty $1\frac{9}{16}$ in. dia. inlet and $1\frac{11}{32}$ in. dia. exhaust valves in Nimonic material. These items are already fitted to polished head C–AHT 100. The guides should be pressed into the cylinder head so that they are left standing proud between $\frac{43}{64}$ and $\frac{25}{32}$ in. (19·45 and 19·84 mm.), after which the valves seats may need re-aligning with the guides.

Use valve springs—outer (Part No. C–AHH 7264) and inner (Part No. C–AHH 7265), also the special valve cotter (pairs) (Part No. C–AEH 761), the valve spring top cup (Part No. C–AEH 760), and the bottom cup (Part No. C–AEH 801). Alternatively, see the use of triple valve springs (Part No. C–AHH 7309) on page 27.

Do not fit the metal oil shroud or the valve stem rubber oil seal that is used on the standard engine.

Standard rocker shaft and valve rockers are used, also the two centre rocker shaft brackets. The valve springs put a heavy load on the rocker shaft, especially at the ends where it is overhung, and, although it is not essential, it is desirable to fit the special front and rear rocker shaft brackets which support the end rockers from both sides (Part Nos. C–AEH 762 and C–AEH 763). Do not refit the springs which hold the rockers apart, but in place of these fit the tubular steel distance pieces leaving an end-float of ·003 to ·005 in. (·0076 to ·0127 mm.) (Part Nos. C–AEH 764 (1 off) and C–AEH 765 (2 off).

The standard tappet adjusting screws may be used, but if the possibility of fracture is to be eliminated, then fit the special screws (Part No. C–AEH 766) which are solid and have no holes drilled in them; the oiling of the ball will be satisfactory without these holes.

Use the high-lift wide-period camshaft (Part No. C–AEH 770) with a tappet setting between valve and rocker of ·018 in. (·457 mm.) hot. This camshaft has a cam lift of ·315 in. (8·0 mm.) and a valve lift of ·452 in. (11·5 mm.). The inlet period is 300° and the exhaust 300°.

Timing is: inlet opens 50° B.T.D.C., inlet closes 70° A.B.D.C., exhaust opens 75° B.B.D.C., exhaust closes 45° A.T.D.C., with valve clearance set at ·018 in. (·46 mm.).

The high-lift, wide-period camshaft can be used with the standard push-rods and tappets satisfactorily, but cover for travel of the cam is only barely sufficient over the base of the standard tappet.

This can be overcome by boring the tappet holes in the cylinder block to a diameter of ·9375 $^{+\cdot0005}_{-\cdot0002}$ in. (23·81 $^{+\cdot013}_{-\cdot005}$ mm.) for a length of $3\frac{1}{8}$ in. (79·38 mm.) from the centre-line of the camshaft and fitting larger tappets of $\frac{15}{16}$ in. (24 mm.) dia. (Part No. AEC 264). This will necessitate the use of shorter push-rods (Part No. C–AEH 767).

With the high lift of the valves it is necessary to undercut the face of the cylinder block to allow the exhaust valves full travel. This machining should be done from the valve guide centre and a flat cutter of $1\frac{17}{32}$ in. dia. used; the cutter should have a $\frac{1}{16}$ in. (1·6 mm.) radius on the outer cutting corner. The undercut in the cylinder block should be $\frac{3}{64}$ in. (3·6 mm.) deep.

Stage 4—*continued*

For durability, when using the high-lift camshaft, it is a benefit to use the steel timing chain sprockets (Part Nos. 12H 244 and C–AEH 771).

In the centre of the cylinder head face two large core holes will be found; thread these and fit water-tight aluminium plugs, which should be faced off carefully to the head face. This will prevent water loss if the cylinder head lifts under arduous conditions. Use the special cylinder head gasket (C–AEH 768).

Thread and plug the one small hole in the centre of the cylinder block face that is opposite to the cylinder head aluminium plug.

To increase water flow through the head drill out to $\frac{9}{16}$ in. (14·29 mm.) dia. the two water holes at the rear end of the cylinder block face.

Engine 18G/18GA

Fit the high-compression (flat top) competition pistons (Part No. C–AEH 736).

These pistons have large, fully floating gudgeon pins, and it is necessary to use special connecting rods, available only as a matched set (Part No. C–AJJ 3357) with connecting rods bearings (Part No. 8G 2259) (set). When using these bearings and the standard main bearings, it is necessary to run in steadily for 30 hours on a test stand or for 1,000 road miles (1600 km.). Do not apply full power at an early stage, but wait until the bearings bed down, and develop a good running condition without temperature rise.

Engine 18GB

Fit high-compression (flat top) competition pistons (Part No. C–AEH 853). These will fit the standard connecting rods.

Engine 18G/GA/GB

If you wish to put your engine on to full power early, then see note reference bearings with initial racing clearances on page 29.

To increase the oil pressure fit a packing piece in the end of the oil release valve cap behind the release valve spring; this should be ·200 in. (5·08 mm.) thick by $\frac{11}{16}$ in. (12·3 mm.) dia. or two packings ·100 in. (2·54 mm.) thick (Part No. AEH 798). 18GB units already have one ·100 in. (2·54 mm.) (Part AEH 798) fitted. See page 41 for further details on oil pump and filter bottle top.

Fit the competition clutch (see page 29).

Fit the large $1\frac{3}{4}$ in. (44·45 mm.) S.U. carburetters as in Stage 3.

Use the special distributor (Part No. C–BHA 4415) (see page 35), which has a suitable automatic advance and no vacuum advance. The static setting should be 6° B.T.D.C. and not more than 8° nor less than 5°. The standard distributor (for H.C. engines), which is Part No. 12H 792, distributor No. 40897, is not quite so suitable, but if it was desired to use it, then it should be set 9° to 11° B.T.D.C.

Sparking plugs should be Champion N57R, but, according to the circuit you may be able to use Champion N62R or N3. Use 100 (minimum) octane fuel.

The engine should develop the following brake-horse-power:

R.P.M.	*B.H.P.*	*R.P.M.*	*B.H.P.*
3,000	62	5,500	120
4,000	89	6,000	121
5,000	111	6,500	119

Stage 5

9·6 to 9·8 : 1 compression ratio (Weber carburetter)

Prepare your engine as Stage 4, but in place of the S.U. 1¾ in. (44·45 mm.) carburetters, fit a 45 DCOE 13 Weber twin-choke carburetter (Part No. C–AEH 785). This will require a special inlet manifold and parts as detailed on pages 47 and 48. See page 31 for particulars of settings.

There is marginal improvement to be gained by the fitting of the Weber carburetter, with some slight loss at the lower r.p.m.

An installation kit is available containing the manifold and all necessary parts to fit this carburetter. (Part No. C–AJJ 3312.)

The carburetter is mounted on synthetic rubber 'O' ring gaskets using double-coil spring washers to prevent vibration of the carburetter mechanism and disturbance of the fuel-to-air ratio. Each fixing nut should be drilled and wired in pairs to prevent them coming slack. Tighten the nuts up fairly firmly, but by gripping the carburetter some slight free movement should be felt.

The steady rod to the rear plate should be adjusted to the free position so that the bolts go easily through the fork ends and brackets.

Tighten bolts solid and lock up fork locknuts.

The engine, using 100 (minimum) octane fuel, should give the following power output:

	R.P.M.	*B.H.P.*	*Gal. per hr. fuel consumption* *Imperial*	*U.S.*
B.H.P. taken at gearbox tail flange	3,000	63·5	4·3	5·2
	3,500	78	5·4	6·5
	4,000	92·5	6·0	7·2
	4,500	106·5	6·6	7·9
	5,000	114	7·1	8·5
	5,500	121	7·5	9·0
	6,000	122	8·4	10·0
	6,500	121	9·0	10·8

For bench testing use Champion N57R plugs, but on the circuit you may be able to use softer plugs. If the circuit is short you may find N3 in cylinders 1 and 4, and N62R in cylinders 2 and 3 will be suitable.

If the circuit is long you may require N62R in cylinders 1 and 4 and N57R in cylinders 2 and 3. The centre cylinders are inclined to run hotter due to the proximity of the two exhaust valves.

Stage 6

10·4 to 10·6 : 1 compression ratio (competition tuning)

Tune as for Stage 4, or Stage 5, but remove $\frac{1}{16}$ in. (1·59 mm.) from the cylinder head face, making the thickness of the head $3\frac{7}{64} \pm ·015$ in. (79 ± ·38 mm.). The standard thickness of the cylinder head is $3\frac{11}{64}\ ^{+·015}_{-·000}$ in. (80·6 $^{+·38}_{-·00}$ mm.). Finally surface grind the face of the head and carefully lap as described on page 27.

Check the opening of the exhaust valves at full lift to ensure they have a minimum of $\frac{1}{16}$ in. (1·59 mm.) over-travel; if not, the undercut in the block face will have to be increased the required amount.

Use Champion N57R sparking plugs.

The engine should give the following power output on 100 (minimum) octane fuel.

	R.P.M.	*B.H.P. on S.U. 1¾ in. Carb. (Two)*	*B.H.P. on Weber Carburetter 45 DCOE 13*	*B.H.P. on Weber with 38 choke 175 main 160 air corrected*
B.H.P. taken at gearbox tail flange	3,000	64	65	64
	3,500	76	82	81
	4,000	91	96	95
	4,500	106	109	108
	5,000	114·5	120	120
	5,500	126	128	127·5
	6,000	128·5	130	131
	6,500	129	127	128

Note.—While using 100-octane fuel and the camshaft as listed for Stage 4, no worthwhile power increase will be gained by further raising of the compression ratio.

Stage 7

Tune as for Stage 6 but machine the head to take larger inlet and exhaust valves, together with twin 2-in. S.U. carburetters. Inlet valves C–AEH 860 in Nimonic alloy are 1·687 in. (42·8 mm.) diameter and should be used with larger exhaust valves C–AEH 861. Twin HS carburetters C–AUD 279 should be fitted to a large bore inlet manifold contained in Installation Kit C–AJJ 3374. This kit has the necessary studs, nuts, brackets, etc., but intake trumpets C–AHT 145 may be added to eliminate blow-back from the carburetters.

Camshaft C–AEH 862 and C–AEH 863 having even wider overlap are now on order, but will only be suitable for sprint-type events where maximum power is required at fairly high revolutions. Pick-up and low speed torque will be poor using these camshafts, and wear on the clutch will consequently be very severe.

For maximum power, bore the engine + ·080 in. (2·00 mm.) and fit lightweight forged piston set C–AJJ 3375. These will fit the standard connecting rods, but are only available in this one size.

OTHER SPECIAL ITEMS

Brakes

After many consecutive applications of the brakes during competition driving some brake fade may be experienced with the standard linings. Competition front disc pads and rear brake-shoe linings or lined shoes are available (see list). The rear linings are made to a thickness suitable for grinding to radius after fitment. The front pads are of a suitable heavy-duty material. With fair competition driving these linings will be free from fade, but will give a harder pedal effort on application.

When the lining friction value is altered from that of the standard car it may be found that changing the rear wheel cylinders to ones of smaller size ($\frac{5}{8}$ in. [15·87 mm.] dia.) will improve the front to rear brake ratio.

As these wheel cylinders have a dowel on the fitting face, it will be necessary to drill a hole in the back plate to match this dowel.

Braze a steel plug in the existing hole and face off level with the plate before drilling the new hole. The size of the hole is ·170 to ·175 in. (4·32 to 4·45 mm.) dia. and drilled ·578 in. (14·68 mm.) above the centre of the cylinder mounting hole and ·350 in. (8·89 mm.) offset from the radial centre-line of the cylinder mounting hole.

When using your car on a racing circuit always remove the dust shields from the front disc brakes. This will enable the discs and brakes to run at a lower temperature and will decrease the possibility of brake fade.

Balancing of road wheel and tyre assemblies

To obtain the smoothest steering, free from all steering-wheel kick, and to eliminate any tendency to front-wheel patter, especially at speeds around 70 m.p.h. (113 km.p.h.) and over, it will be found beneficial to have the front road wheel and tyre assemblies statically and dynamically balanced. This usually results in balance weights being fitted on both sides of the rims, but this dynamic balancing is well worth while. Balance may require re-checking every few thousand miles if the car suffers brake locking, etc., as this may again put the tyres out of balance enough for the effect to be felt.

It is advisable to keep front tyres in good condition and free from uneven tread wear. This can sometimes be done by changing tyres from front to rear before uneven wear develops. Pick the best tyres for use at the front (or those that have even tread wear and run true) before they are dynamically balanced. Balancing a tyre which has flats or uneven wear is not usually very successful. In some cases the tread can be buffed true, but this is not an economic way of using rubber.

Valves and guides

The standard valves are of high quality, but special valves are available in Nimonic alloy—inlet (Part No. C–AEH 757) and exhaust (Part No. C–AEH 758), see list. These must be used in conjunction with special spring collars (Part No. C–AEH 760) and also special cotters (Part No. C–AEH 761) to suit the half-round groove in the valve stem. If triple valve springs are used, top collar (Part No. C–AHH 7313) must be used. These valves should be used in conjunction with bronze (Hidural 5) guides for both the inlet and exhaust valves, inlet (Part No. C–AEH 755) and exhaust (Part No. C–AEH 756). The inlet guide is $2\frac{1}{16}$ in. (27 mm.) long and the exhaust $2\frac{5}{16}$ in. (33·4 mm.) long. They should be pressed into the head so that they are left standing out between $\frac{49}{64}$ and $\frac{25}{32}$ in. (19·4 and 19·8 mm.). Polished cylinder head C–AHT 100 is supplied with standard valves but Hidural bronze guides.

Cylinder head gasket

When the compression is raised it may be necessary to use a reinforced gasket. A competition cylinder head gasket is available (see list) constructed from ·009 in. copper and steel with internal reinforcements (Part No. C–AEH 768). As the cylinder block and head faces may suffer some distortion in the early life of the engine it is advisable to check these faces for flatness before fitting the new gasket. If the faces are distorted they should be finely surface ground, and a certain amount of careful lapping or flat scraping is worth while. Do not lap excessively as this will only produce an uneven surface. Check them finally together with marking.

Before replacing the cylinder head studs slightly countersink (not too heavily) the tops of the threaded holes in the cylinder block. This will enable the head to pull down around the studs and seal more efficiently.

To maintain the clamping pressure of the cylinder head onto the gasket it is advantageous to remove the flat washers under the 11 cylinder head nuts and replace these with more rigid ones of $\frac{1}{8}$ in. (3·18 mm.) thickness by $\frac{3}{4}$ in. (19 mm.) outside diameter and with a hole ·390 in. (9·91 mm.) dia. These can be turned up from a 40-ton steel bar, or if made from mild steel they should be case-hardened.

Valve springs

The valve bounce r.p.m. on the standard engine is 6,230 r.p.m. and the valve springs, operating mechanism, and drive are safely stressed to maintain this.

If for very special competition purposes it is desired to raise the valve bounce period, the appropriate springs may be selected from the following table:

Part No. outer springs	*lb.*	*Part No. inner springs*	*lb.*	*Total lb. full lift*	*Valve bounce r.p.m.*		
					Standard camshaft	*Comp. camshaft* C–AEH 714	*Comp. camshaft* C–AEH 770
1H 1111*	117	1H 723*	50	167	6,230	6,500	6,500
1H 1111	117	C–1H 1112	57	174	6,360	6,600	6,600
C–AHH 7264	140	1H 723	50	190	6,480	6,700	6,700
C–AHH 7264	140	C–1H 1112	57	197	6,600	6,750	6,750
C–AHH 7264	140	C–AHH 7265	70	210	6,680	6,800	6,800

* Standard engine.

It is advised that these springs be used only for very special events, as if used under everyday conditions the cams and followers will have a shorter service life. The springs will not necessarily give an increase in brake-horse-power, but will extend the same horse-power up to valve bounce. This is sometimes useful in enabling a lower gear to be retained, still maintaining the same maximum speed, with increased power for acceleration.

As an absolute maximum, triple valve springs (Part No. C–AHH 7309) may be used, in conjunction with a special valve spring top collar (Part No. C–AHH 7313). No bottom collar is used, but the counterbore around the valve guide in the head face must be increased to 1·520 to 1·515 in. (3·86 to 3·85 mm.) dia. The springs are supplied, tightly nested in sets of three, giving a total full lift load of 230 lb. (104·3 kg.).

The valve crash position will be above 7,000 r.p.m.

Rear axle ratios

With the variety of axle ratios available (see page 48), and the standard and close-ratio gears it is possible to obtain a combination suitable for most competition purposes. Ensure special equipment is available when dismantling 'Tubed' axles, and follow instructions in the Workshop Manual. The 'Tubed' axle, originally fitted only to the GT, was fitted to the Tourer from Car No. 132923 (wire wheels) and 132916 (disc wheels).

Care is required when dismantling the 'Tubed' axle fitted to later cars, as these require the use of special tools as described in Workshop Manual AKD 3259 G.

When changing the crown wheel and pinion, it should be noted that there are 18 different sizes of distance collar (2 off required) and eight pinion thrust washers (1 off required) which must be selected to fit (see Parts List AKD 3547).

Various axle ratios are available, but care should be taken to ensure that the correct differential cage or limited slip differential is used.

Close ratio gearbox (18G/18GA/18GB) (Not suitable for 18GD/18GF)

Alternative gears are available to convert the gearboxes fitted to 18G, 18GA, and 18GB engines. The ratios of the all-synchromesh gearboxes fitted to 18GD and 18GF are closer but no special close ratio gears are available at present.

	Standard ratio	*Close ratio*	*All-Synchromesh ratios*
First	3·64 : 1	2·45 : 1	3·44 : 1
Second	2·21 : 1	1·62 : 1	2·167 : 1
Third	1·37 : 1	1·27 : 1	1·382 : 1
Top	1·00 : 1	1·00 : 1	1·00 : 1

The following special parts will be required:

First motion shaft (18G/18GA) ..	C–22H 472 (26 teeth)
(18GB)	C–22H 846 (26 teeth)
Second speed gear (was C–1H 3299)	C–22H 1094 (32 teeth)
Third speed gear	C–1H 3300 (29 teeth)
Laygear (early small diameter) ..	C–1H 3298 (25, 22, 19, and 11 teeth)
(large diameter)	C–22H 932 (25, 22, 19, and 11 teeth)

Note.—The correct second speed gear baulk ring **must** be used with each second speed gear. Use 11G 3063 with C–1H 3299 and 22H 249 with C–22H 1094.

Second speed baulk ring 22H 249 was fitted in production from the following Engine Nos.:

18GB/U/H31472	18GB/RU/H31003
18GB/U/L29123	18GB/RU/L25995

Large diameter layshaft fitted in production from the following Engine Nos.:

18GB/U/H74720	18GB/RU/H74529
18GB/U/L60597	18GB/RU/L58224

For advanced stages of tune and severe competition use, the early gearbox may be modified to take a larger diameter layshaft. The following parts will be required in addition to the above close-ratio parts, apart from the different laygear.

*Gearbox casing assembly (overdrive)	48G 314
*Gearbox casing assembly (non-overdrive)	48G 315
Layshaft	22H 465 or 22H 571
Laygear (close-ratio) (was C–22H 464)	C–22H 932
Thrust washer (for laygear, front)	22H 466
Thrust washer (for laygear, rear) }	22H 467
Thrust washer (for laygear, rear) } Alternatives	22H 468
Thrust washer (for laygear, rear) }	22H 469
Thrust washer (for laygear, rear) }	22H 470
Caged needle-roller bearing (4 off)	22H 471
Distance piece	22H 672

* If these gearbox casings are not available, the existing one may have the layshaft mounting holes fine-bored and reamed in line to ·6688/·6699 in. (16·98/17·01 mm.) diameter.

Fuel pump

Check the fuel flow of your petrol pump by removing the two float-chamber tops complete with the fuel lines. Unclip the main fuel line and reassemble it alongside the car so that the two float-chamber tops (complete with needles and levers) can be held over a 2-gal. (2·4 U.S. gal., 9·1-litre), or larger can. Switch on the pump and check the time for 1 gal. (9·6 U.S. pints, 4·55 litres) to flow. The standard engine uses a maximum of approx. 7·2 gal. (8·6 U.S. gal., 32·76 litres) an hour, and the engine tuned to Stage 6 uses approximately 9 gal. (10·8 U.S. gal., 40·95 litres) an hour. A good pump may flow at 13 gal. (15·6 U.S. gal., 59·15 litres) an hour, but a pump needing attention may only flow at 6 gal. (7·2 U.S. gal., 27·3 litres) an hour.

If a pump is required which will give a flow with a wide safety margin S.U. fuel pump (Part No. AUA 173) is available. The mounting bracket will need slight alteration to mount this pump and the fuel lines reset to suit. Alternatively two standard fuel pumps could be used.

Clutch

With increased power output a competition clutch having more torque capacity, etc., may be required (see page 45 for details). This clutch assembly has a stronger diaphragm spring, and a driven plate with riveted and bonded linings. It is desirable to ventilate the clutch pit for competition purposes. This may be done by removing the drain split pin in the base of the bell housing and drilling the hole out to $\frac{5}{8}$ in. (15·9 mm.) dia. Discard the rubber bellows from the clutch operating lever. Drill a hole $1\frac{1}{4}$ in. (31·7 mm.) dia. at the top centre of the bell housing (3 in. [76·2 mm.] down from the bolting flange) and make up and fit a 22 S.W.G. sheet-metal square box cover over this hole 2 in. × 2 in. × $\frac{5}{8}$ in. (50·8 mm. × 50·8 mm. × 15·9 mm.) deep with an open end $\frac{5}{8}$ in. × 2 in. (15·9 mm. × 50·8 mm.) towards the clutch lever side of the gearbox and the top, bottom, and other end closed in. A flange $\frac{3}{8}$ in. (9·5 mm.) wide can be made top and bottom to fix the cover to the bell housing with four $\frac{1}{8}$ in. (3·2 mm.) dia. rivets.

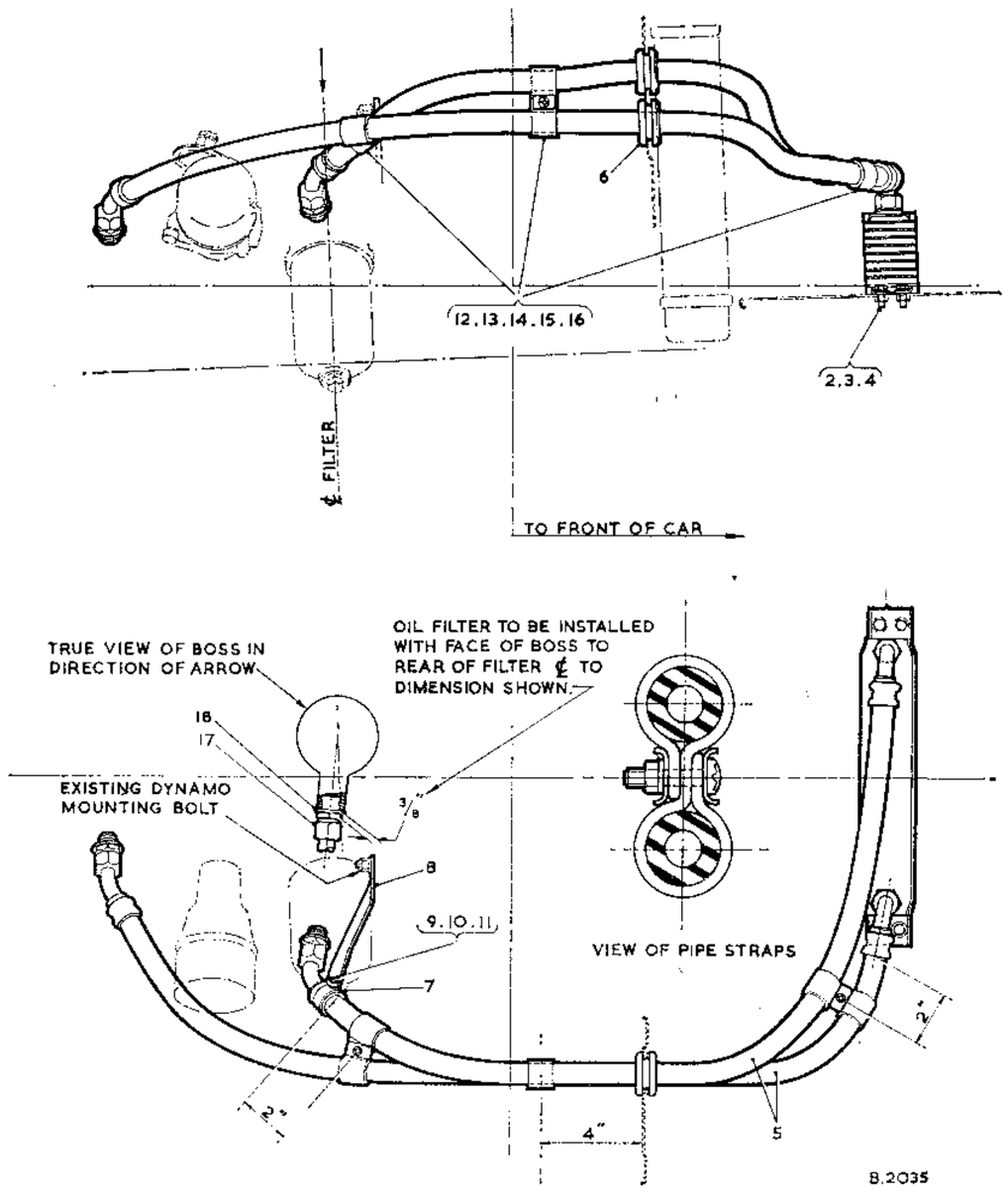

Fig. 1

The oil cooler general arrangement

1. Oil cooler.
2. Screws—cooler to front apron.
3. Washers—plain—for screws.
4. Washers—spring—for screws
5. Flexible pipes.
6. Grommets.
7. Clip—flexible pipe.
8. Strap—support.
9. Screw—clip to support strap.
10. Washer—spring—for clip.
11. Nut for clip.
12. Clips—strap (rubber).
13. Plates—clamp—for strap clip.
14. Screws for clamp plate.
15. Washers—spring—for clamp plate.
16. Nuts for clamp plates.
17. Union adaptor.
18. Washer—union adaptor.

Crankshaft bearings

The standard main and big-end bearings have suitable close clearances for the quietness of the running of the standard engine. When using the engine for racing purposes, especially above 6,000 r.p.m., it is desirable to use both main and big-end bearings with increased initial clearances. The standard bearings are of lead-indium type. The increased clearance bearings of the lead-indium type are:

18G/18GA

Main bearings (set of six halves), Part No. C–8G 8843 (bearing stamped V.P. 4769), and big-end bearings (set of eight halves), Part No. 8G 2259.

18GB

For standard 18GB crankshaft, use Part No. C–8G 8843, plus Part No. C–18G 8021 (intermediate main bearings), and big-end bearings Part No. C–18G 8022. For competition hardened crankshaft C–AEH 822 use **only** main bearing set C–18G 8103, which have additional grooves.

Oil cooler

An aluminium-alloy oil cooler (Part No. ARO 9809) is now standard. This is essential for competition use and can be supplied for earlier cars together with high-duty flexible hoses and fittings, for mounting behind the radiator grille as shown in Fig. 1 (see Mechanical Parts List for details).

A larger competition oil cooler, Part No. C–ARO 9875, is also available.

An oil cooler C–AHT 181 is now available to save disconnecting the oil cooler in winter. The cover will clip onto any size oil cooler supplied by us.

Weber carburetter 45 DCOE 13 (Part No. C–AEH 785)

This will require a special inlet manifold and parts as detailed on pages 47 and 48 (see Figs. 2 and 3 for installation details) and contained in installation kit Part No. C–AJJ 3312.

The carburetter is mounted on synthetic rubber 'O' ring gaskets to prevent vibration of the carburetter mechanism and disturbance of the fuel-to-air ratio.

Under each carburetter fixing nut a double-coil spring washer should be fitted; each fixing nut should be drilled and wired in pairs to prevent them coming slack. Tighten the nuts up fairly firmly, but by gripping the carburetter some slight free movement should be felt.

The steady rod is fitted from the inlet manifold to the rear plate, adjust the rod at both ends so that the bolts go easily through the forks and brackets. Tighten the bolts solid and lock up the fork locknuts (see Fig. 3 for details).

The settings supplied in the carburetters should be as below:

Auxiliary venturi	5·000 mm.
Chokes	36 mm.
Main jet	1·70 mm.
Air correction jet	1·60 mm.
Emulsion tubes	F16
Idling jets	·60/F8
Pump jets	·60

Needle valve 2·25 mm. must be spring-loaded type.

Level between the float and cover gasket to be 5 mm.

When checking the level between the float and the cover gasket it is **essential** that the float is allowed to hang vertically so the 5 mm. is measured **before**

(*continued on page* 34)

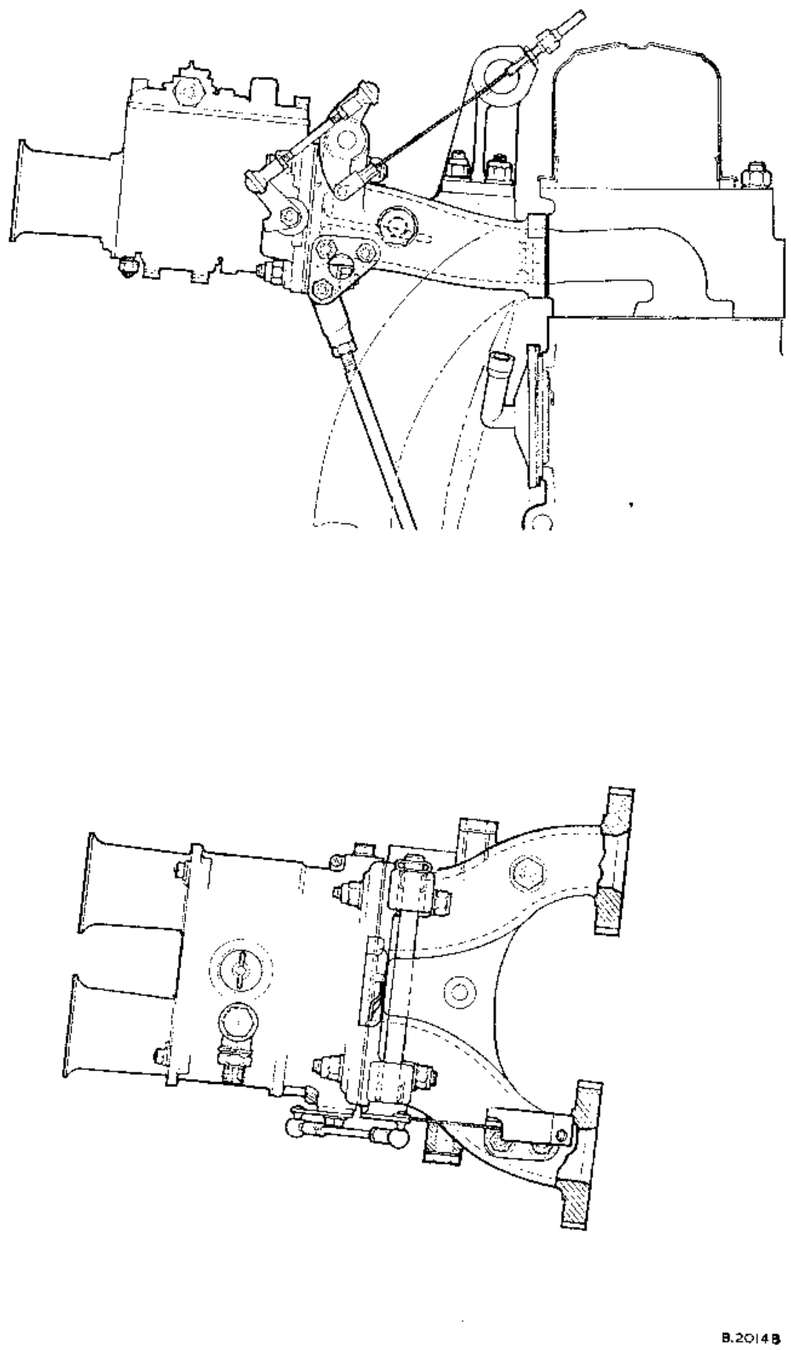

Fig. 2
Weber carburetter installation

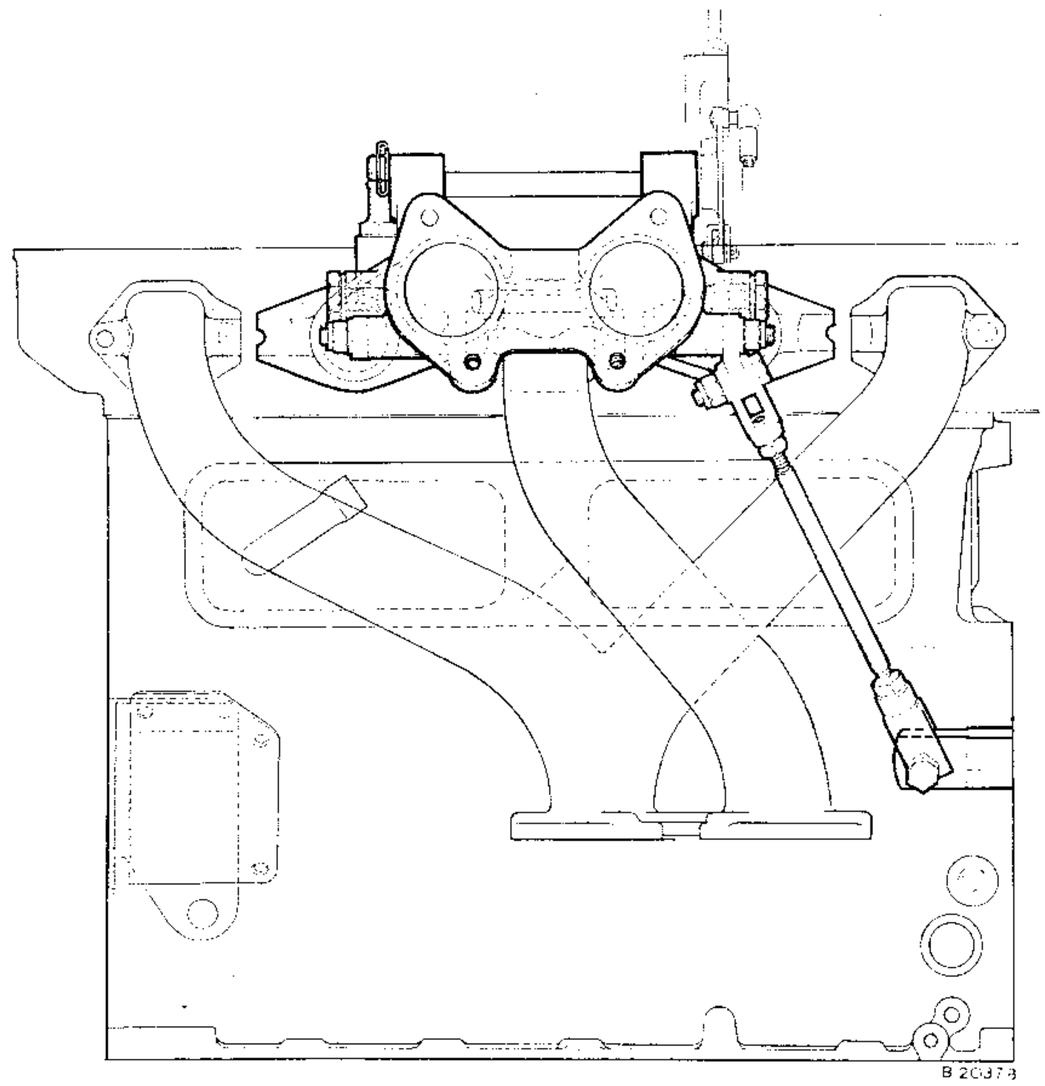

Fig. 3
Weber carburetter—steady rod arrangement
(Kit C–AJJ 3312)

the spring in the needle valve is compressed. If the lid is held horizontal, a false setting will result.

The pump inlet valve should have a hole of 2·00 mm. in the top and an exhaust hole in the side of 1·00 mm. dia. The accelerator pump operating rod should measure 2½ in. (6·35 cm.) total length end to end. These settings should be found correct for Stage 5 onwards, **but non-approved manifolds may upset carburation.**

For endurance running in long-distance races a richer 175 main is beneficial.

The spring-loaded needle valve prevents mixture variation due to vibration.

If the pick-up condition can be tolerated, the power can be slightly increased at the top end by fitting 38 or 40 mm. chokes and 175 main jets with a 160 air jet; again for long distance a 180 or 185 main used with a 160 air jet will maintain performance, but note that it slightly decreases the power at the lower range.

It is sometimes found that to use a 3·5 auxiliary venturi in place of the 5·00 will give improved pick-up conditions, but this is a matter of trial under the local conditions. When fitting the special operating cable for the accelerator, it will be necessary to remove the cable reaction pillar above the pedal, and to slot this approximately ·075 in. (1·9 mm.) wide from end to end, on one side to enable the inner cable to be assembled.

SUSPENSION TUNING

Modifications to the suspension will normally affect the handling characteristics of the car and give either more 'oversteer' or 'understeer'.

These terms are recognizable as follows:

Understeer—The vehicle will tend to go straight on when the front wheels are turned on lock; i.e. the slip angle of the front tyres is greater than that of the rear.

Oversteer—The vehicle will tend to rotate when the front wheels are turned on lock; i.e. the slip angle of the rear tyres is greater than that of the front.

Factors tending towards understeer:

1. Stiffer front springs.
2. Fitting a front anti-roll bar, or increasing the diameter of bar.
3. Lower front suspension (premature contact of front bump stops).
4. Increasing rear tyre pressure above recommended figures.
5. Decreasing front tyre pressures. MUST EQUAL AT LEAST recommended figures.

Factors tending towards oversteer:

1. Stiffer rear springs.
2. Reducing size of front anti-roll bar, or fitting one to rear if available.
3. Raising front suspension (or renewing front springs if weakened).
4. Increasing front tyre pressure above recommended figures.
5. Decreasing rear tyre pressures. MUST EQUAL AT LEAST recommended figures.
6. Lowering rear suspension (premature contact of rear bump stops).

Road springs

Two main factors should be considered when selecting road springs for suspension tuning: (i) the stiffness of the spring, and (ii) the working load of the spring.

(i) The stiffness of the spring is expressed in lb. per inch (or kg. per cm.) which means that one inch of deflection will return a load equal to the rate. Note that this rate is effective at the wheel in the case of rear non-independent axles, but is a function of the independent suspension geometry in the case of the front spring.

(ii) The working load of the spring is determined by the type of use to which the car will be put. A rally car carrying extra fuel and tyres over rough country will require a spring with a high load capacity. For short-circuit racing a low-load capacity spring will be required.

It should be noted that springs which have lost their load capacity due to 'settling', can produce the result of a lowered car. This is particularly noticeable in the case of rear springs where premature contact between the rear axle and the bump stops will produce oversteer tendencies.

Road springs

Part No.	*Type*	*Rate (lb./in.)*	*Working load (lb.)*	*Deflection at working load (in.)*	*Fitted height (in.)*
AHH 6451	Coil	348	1030	2·965	7·0
†AHH 5789	Coil	480	1193	2·49	6·6
C–AHT 21	Coil	480	1193	2·49	6·14
*AHH 7080	Leaf	93	450 (flat)	4·97	
‡AHH 6453	Leaf	99	400 (flat)	4·04	
C–AHH 8343	Leaf	100	375 (flat)	3·75	
†AHC 31	Leaf	99	510 (flat)	3·20	
AHH 7346	Leaf	124	542 (flat)	4·37	
C–AHT 20	Leaf	124	542 (flat)	3·37	

Anti-roll bars

§ $\frac{9}{16}$ in. (14·3 mm.) AHH 7329 (2 off bearing AHH 6541 also required).

† $\frac{5}{8}$ in. (15·9 mm.) C–AHH 7593 (includes bearings).

$\frac{3}{4}$ in. (18 mm.) C–AHH 7924 (includes bearings and locators).

Installation kit C–AJJ 3306 is required if the car has not previously been fitted with an anti-roll bar, and can be used with any of the above anti-roll bars.

Shock absorbers

For competition work it may be desired to fit shock absorbers with a stiffer setting as follows:

Shock absorber—front .. .. C–AHH 7104 2 off
Shock absorber—rear R.H. .. .. C–AHH 7105 1 off
Shock absorber—rear L.H. .. .. C–AHH 7106 1 off

New shock absorbers can be changed from standard to stiff setting by fitting valve assembly—front C–AHH 7217, 2 off and valve assembly—rear C–AHH 7218, 2 off. This is not advisable if any wear has taken place.

* Fitted to 'MGB' Tourer from Car No. 11313.
‡ Fitted to Tourer prior to Car No. 11313.
† Fitted to 'MGB' GT.
§ Fitted to all 'MGB' Tourers from Car No. 108039.

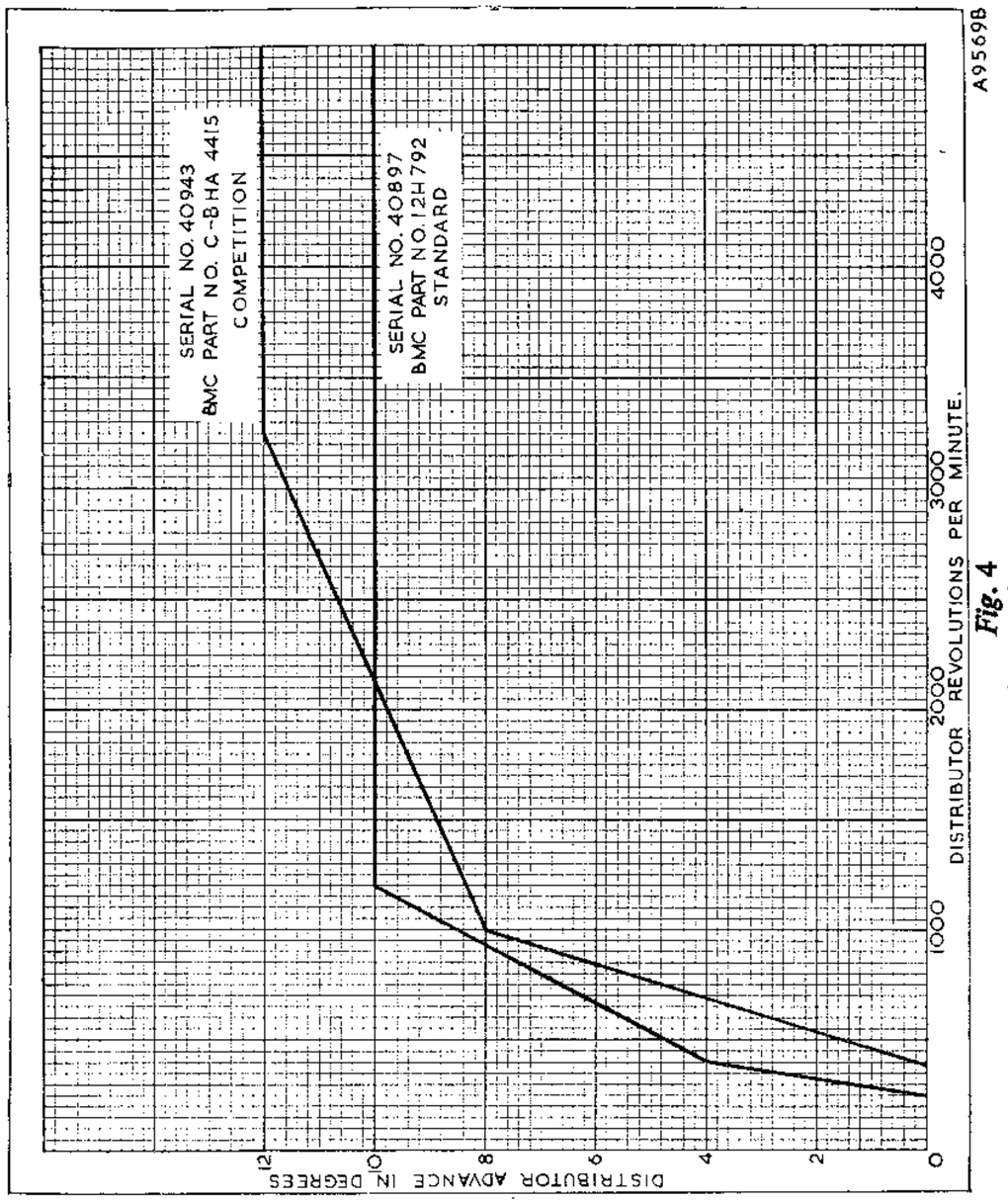

Fig. 4 Distributor advance curves

Distributor

The special distributor used in Stage 4 has no vacuum advance and has an advance curve as illustrated in Fig. 4.

The Part No. is C–BHA 4415 (Lucas 40943A with 32-oz. spring).

The automatic advance in crankshaft degrees is 24° and with a static setting of, say, 6° crankshaft degrees B.T.D.C. gives a maximum advance of 30°.

Tyres and tyre pressure

All testing at the works is carried out on Dunlop tyres and consequently no information is available on the effect of fitting other makes of tyre. Any queries of this nature should be directed to the tyre manufacturer concerned.

Advice on the use of Dunlop racing tyres and recommended pressure for competition use may be obtained from the Competition Department, Dunlop Ltd., Fort Dunlop, Erdington, Birmingham 24, England.

Passengers of average height or less will benefit from a passenger foot-rest now available. When braking, there will be no tendency to slide forward out of the seat, which can then be left further back to simplify entry and exit. Ensure that the correct part number is ordered for right- or left-hand drive cars, i.e.:

C–AHH 7114 Passenger foot-rest—R.H. Drive
C–AHH 7118 Passenger foot-rest—L.H. Drive

Sparking plugs

The standard plug was Champion N5, but is now N–9Y. For competition purposes N3 is recommended, or if a colder grade of plug is required use N62R, or colder N57R.

Dynamo

For long-distance races it is preferable to run the dynamo at a slower speed by the fitting of a suitable pulley and drive belt (see list for details, page 47).

Exhaust system

The twin exhaust manifold down pipes and twin silencers are very efficient but for competition purposes a lightweight steel tube free-flow manifold is available, (Part No. C–AHH 7103), also the centre silencer can be removed and replaced by a section of plain pipe 2 in. (51 mm.) outside diameter and approximately ·048 in. (1·2 mm.) thick. The tail pipe and rear silencer should be retained.

The noise level will, of course, be increased (see **'FOREWORD'** regarding regulations).

Fly-off hand brake

To convert your hand-brake to the fly-off type, the following are required:

Pawl	C–AHH 7223
Operating rod—early cars	C–AHH 7222
from Car No. 115596 and all GHN/D–4 cars	C–AHC 551

Headlamp cowls (Sebring)

If regulations permit, Perspex headlamp cowls can be fitted. The necessary parts and instructions are contained in kit C–AJJ 3307. These prevent stone damage to the light units, as well as improving air flow in this area.

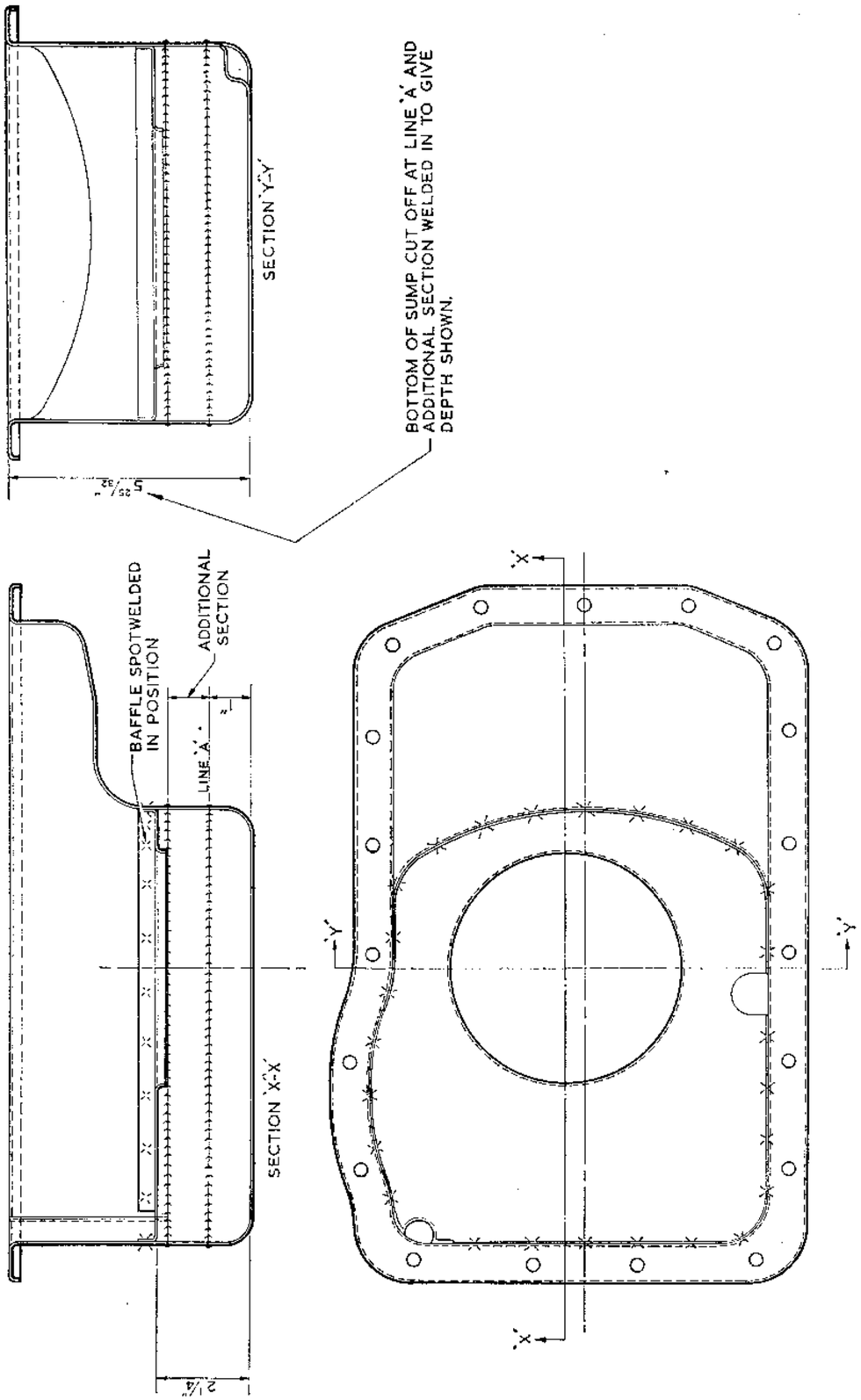

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Fig. 5
Details of the increased-capacity oil sump (for details of baffle plate see Fig. 6).—Note 18G/18GA only

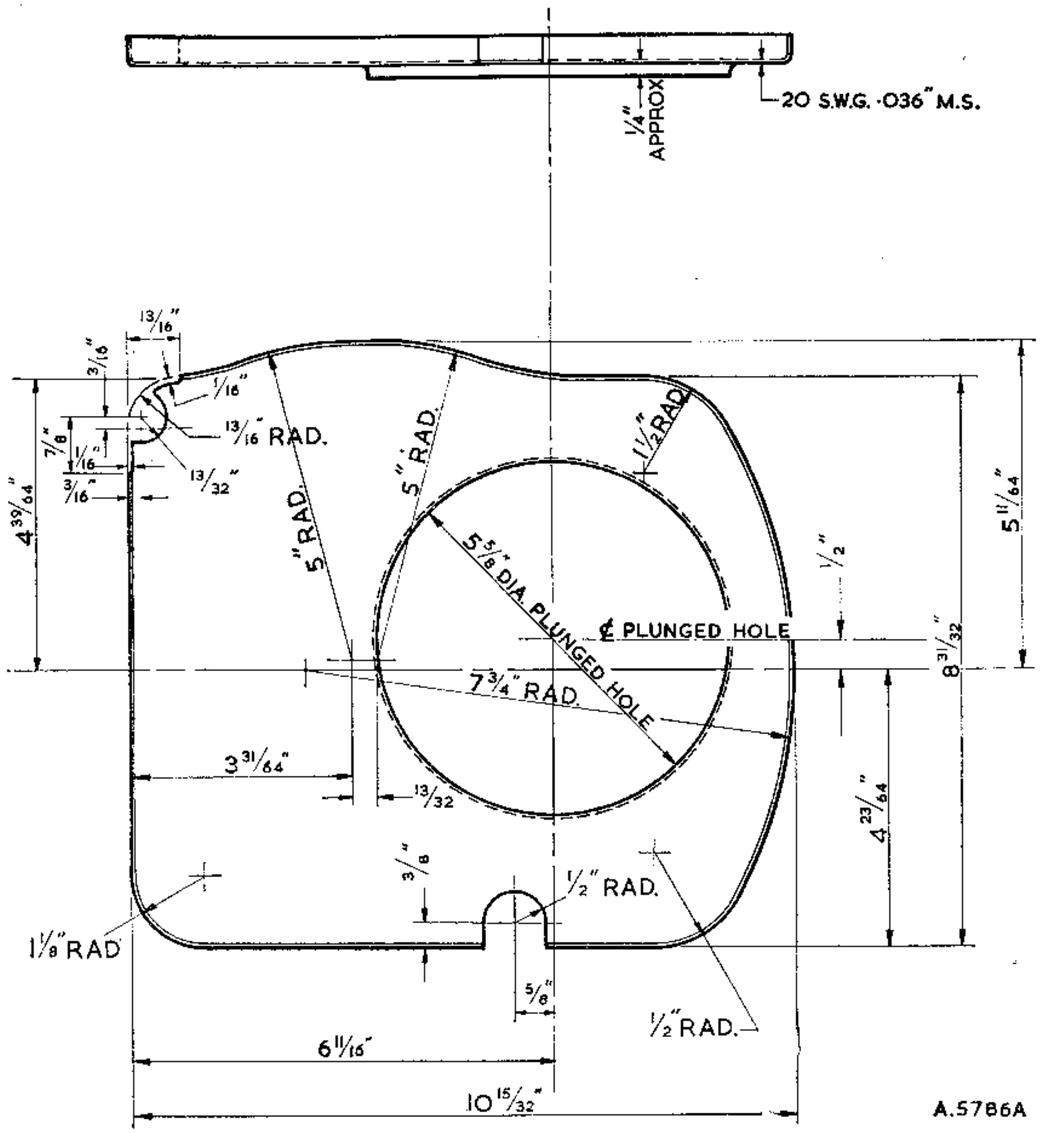

Fig. 6
Detail of oil sump baffle plate

Crankshaft

The standard crankshaft is quite satisfactory, but with continued high duty in due course will show some wear, and may need renewing at intervals. It may be cheaper to renew the standard shaft at suitable intervals. If required, an induction-hardened heavy-duty crankshaft can be used (see list, page 46).

Timing chain sprockets

With high r.p.m. and the use of high-lift camshafts the sprockets have to withstand a much heavier duty. The standard sprockets are cast iron, but steel sprockets for both crankshaft and camshaft are listed on page 46.

Note—Mini-Cooper 'S' camshaft sprockets do not give correct valve timing.

Engine oil sump

Especially in long-distance racing, the oil level may drop to a position where oil surge on violent cornering and braking may cause a temporary but complete loss of oil pressure. This could be seriously detrimental to the engine and may result in bearing failure. It is advisable to increase the oil capacity above the oil pump inlet and to fit a baffle in the oil sump to prevent the oil surging away from the pump inlet. This can be done by fitting the deep sump or altering your own sump by cutting through approximately 1¼ in. (31·7 mm.) from the bottom and gas welding in a 1-in. (25·4 mm.) distance piece of sheet metal, or obtaining another sump and cutting off 2¼ in. (57·1 mm.) from the bottom and welding this to the top of your sump for the 18G/18GA engine. The depth should be increased by 1⅜ in. (35 mm.) on the 18GB engine.

Make up and spot-weld the surge baffle to the inside of the oil sump as illustrated in Figs. 5 and 6, for 18G/18GA engines, but larger sumps already modified are available (Part No. C–AEH 832) for 18GB engines and later versions.

Fit the correct packing piece between the pump strainer and pump extension for 18G/18GA (Part No. C–AHH 7238) 18GB (Part No. C–AEH 847), using an extra gasket and longer bolts. This will lower the oil pick-up to the correct position.

Weld an extension piece onto the end of your oil dip-stick so that the original oil level is maintained, or use the stick as it is, and make a new maximum high-level mark 1 or 1¼ in. (25·4 or 31·8 mm.) above the existing one.

For short circuits, where oil levels may not drop, the standard depth of sump should be found satisfactory, but the surge baffle should be made up and fitted as illustrated.

Gearbox dipstick and oil seal

To ensure that no oil leaks occur from the gearbox during the arduous conditions of competition work you can fit a gearbox dipstick (Part No. AEC 3683) which is retained by rubber sealing rings.

The one listed will need alteration by cutting off 2 7/16 in. (61·9 mm.) and re-marking 'HIGH' and 'LOW' levels (as old dipstick); this will then make it suitable for the 'MGB' gearbox.

Also ascertain if the front gearbox cover is fitted with a high-duty mainshaft oil seal (Part No. 22H 475); at the same time check the front gearbox cover (in which the seal is mounted) for perfect flatness and refit with jointing compound. This will ensure that no gearbox oil will get through onto the clutch facings.

Water thermostat and fan

For sustained maximum power and speed, such as in road-racing conditions, it is advantageous to remove the thermostat. This will ensure the maximum water flow only if blanking sleeve (thermostat by-pass) Part No. 11G 176 is fitted.

The fan should also be removed and the bolts refitted with flat washers.

Oil pump (*Standard*)

The oil pressure may be increased by packing the oil relief valve spring; this is done by fitting a circular steel packing of 33/64 in. (12·3 mm.) dia. in the end of the release valve cap and behind the relief valve spring. These packings may be of ·100, ·200, ·300, or ·400 in. (2·54, 5·08, 7·62, or 10·16 mm.) thick, or multiples of the ·100 in. (2·54 mm.) packing can be used.

Under the cap two fibre gaskets are fitted; one of these can be removed, or, better, both removed and replaced with one copper gasket (Part No. 6K 431).

Between 70 and 80 lb./sq. in. (4·92 and 5·62 kg./cm.²) and up to 100 lb./sq. in. (7·03 kg./cm.²) is a good pressure and dropping to 30/40 lb./sq. in. (2·11/2·81 kg./cm.²) is satisfactory.

Sometimes the oil pressure increases up to, say, 5,500 r.p.m. and drops off in pressure beyond this speed. This can be prevented by machining the pump cover and making twin inlet ports to the pump. (See Fig. 7 to machine early pumps).

A point which should be carefully checked is the oil pump strainer. The threaded attachment plate is spot-welded to the inside face of the strainer top plate. If the strainer top plate is not flat, or if the attachment plate has not pulled up perfectly to the under side of the top plate, an air leak can occur between the attachment plate and the top plate. Ensure that the top plate is flat over the gasket area, and to make sure that no air leak can occur carefully warm the whole strainer up and tin around the hole in the top plate to the attachment plate so that the bottom corner joint is sealed. Under normal conditions this position is under oil level, but when oil surge occurs, as in competition work, it may become uncovered.

Oil filter

It is not essential, but it gives some slight improvement in the oil flow, to machine an undercut in the face of the top casting of the filter bottle; this allows an unrestricted flow of oil from the square feed hole. (See Fig. 8 for details.) You must remove the circular plate from the casting to do this; lever the plate off carefully, and ensure that it is flat before replacing and peening over.

Torque wrench settings

When tightening the cylinder head nuts to 50 ft. lb. (6·91 m. kg.) ensure that they are correctly and evenly tightened.

The main bearing nuts should be tightened to 70/75 ft. lb. (9·68/10·37 m. kg.).

Big-end bolts should be tightened carefully to 40/45 ft. lb. (5·53/6·22 m. kg.) only; overtightening to more than 45 ft. lb. (6·22 m. kg.) will only cause fracture of the bolts in operation.

Tighten the flywheel bolts to 40 ft. lb. (5·53 m. kg.).

Tighten the gudgeon pin bolts to 25 ft. lb. (3·46 m. kg.) and clutch bolts to 25/30 ft. lb. (3·46/4·15 m. kg.).

Flywheel

A lightened cast iron flywheel weighing 16¾ lb. (7·6 kg.) is now available (Part No. C–AHT 86). This must be balanced with the crankshaft and clutch assembly before fitting, and is suitable only for engines with prefix 18GB and is NOT suitable for earlier or later engines.

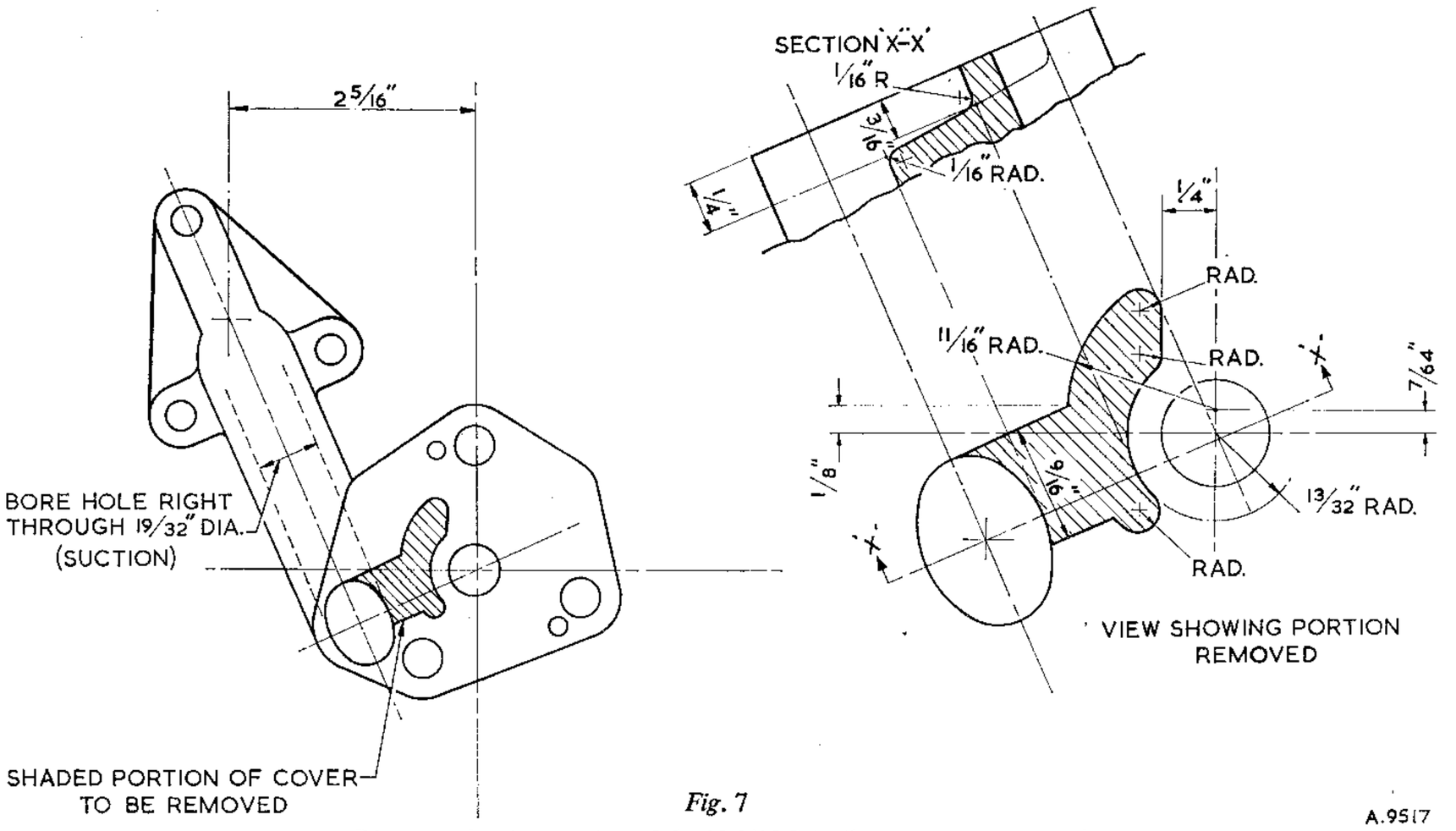

Fig. 7

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Diagram showing portion of the 18G/18GA oil pump cover removed
Note. Part of this machining is already incorporated on 18GB engines

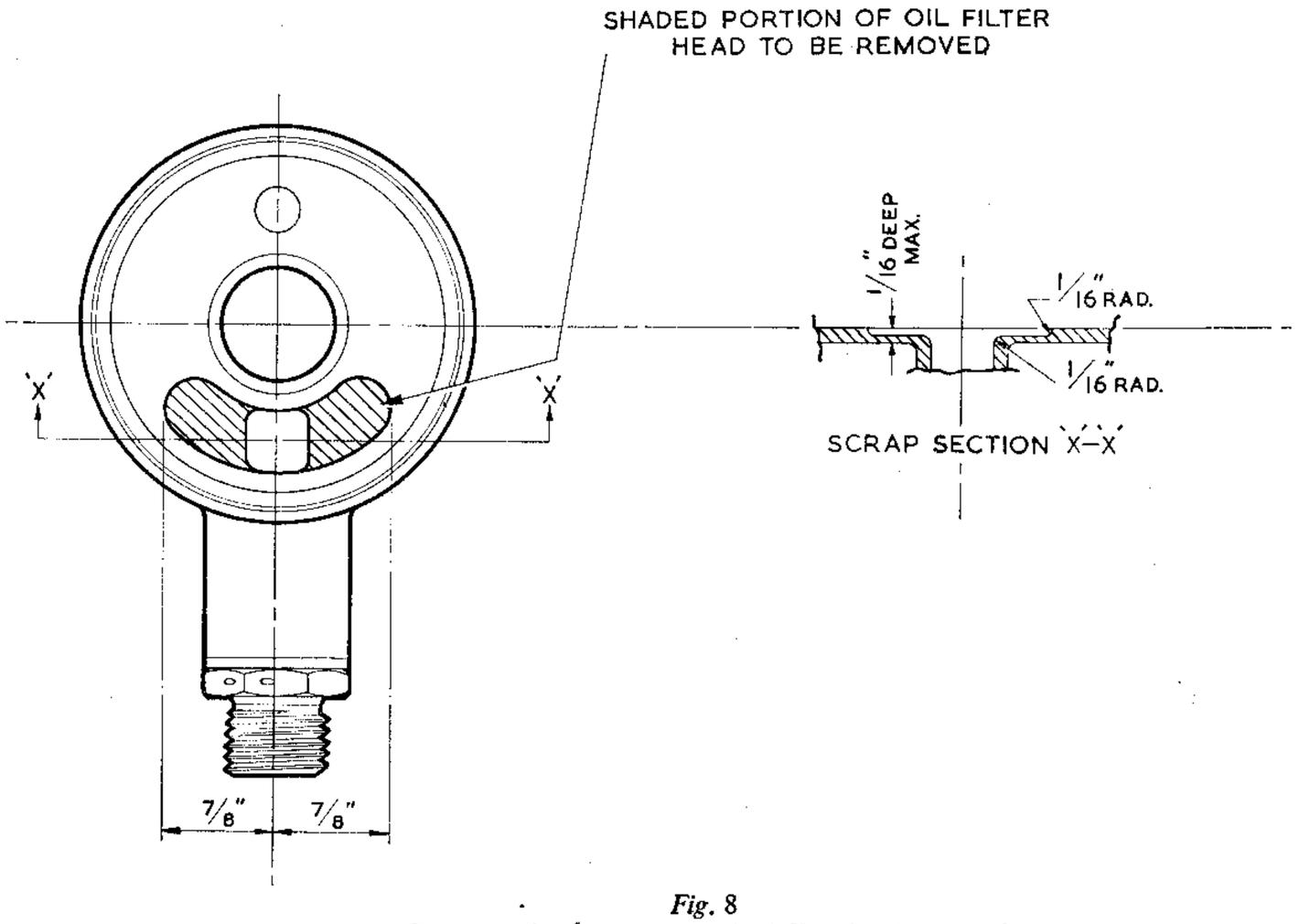

Fig. 8

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Diagram showing portion of oil filter head removed

COMPETITION EQUIPMENT

	Part No.	Qty./car
General		
Disc wheel—14 in. with 5-in. wide rim (standard on GT)	AHH 8112	5
Wire wheel—14 in. with 5½-in. wide rim (70-spoke)	C–AHH 8530	5
Bonnet securing straps leather	C–AJJ 3381	1 set
Sebring headlamp cowl kit	C–AJJ 3307	1
Workshop Manual	AKD 3259	1
Passenger foot-rest (right-hand-drive cars)	C–AHH 5114	1
Passenger foot-rest (left-hand-drive cars)	C–AHH 5118	1
Brakes		
Brake pads (set 4) (Ferodo D.S.11)—competition facings	C–8G 8834	1
Rear brake-shoe and lining assembly (set 4) (Ferodo V.G.95/1) (competition facings)	C–8G 8828	1
Rear brake lining (with rivets) (set 2) (Ferodo V.G. 95/1) (competition facings)	C–8G 8829	2
Rear wheel brake cylinder assembly—⅝ in. (15·9 mm.) dia.	17H 8773	2
Pawl, hand brake lever (for fly-off hand brake)	C–AHH 7223	1
Pawl rod (for fly-off hand brake)— early cars	C–AHH 7222	1
later cars	C–AHC 551	1
Brake servo kit	8G 8732	1
Suspension		
Shock absorbers (competition setting)—front	C–AHH 7104	2
Shock absorbers (competition setting)—rear R.H.	C–AHH 7105	1
Shock absorbers (competition setting)—rear L.H.	C–AHH 7106	1
Shock absorber valve assembly (only) (competition setting)—front	C–AHH 7217	2
Shock absorber valve assembly (only) (competition setting)—rear	C–AHH 7218	2
Front coil springs	AHH 6451	2
Front coil springs — See page 34 for details	AHH 5789	2
Front coil springs	C–AHT 21	2
Rear road springs	AHH 7080	2
Rear road springs	AHH 6453	2
Rear road springs — See page 34 for details	C–AHH 8343	2
Rear road springs	AHH 7346	2
Rear road springs	C–AHT 20	2
†Optional extra anti-roll bar—⅜ in. (14·3 mm.) dia.	AHH 7329	1
Bearing for ⅜ in. (14·3 mm.) anti-roll bar	AHH 6541	2
*Alternative ⅝ in. (15·9 mm.) dia. anti-roll bar (with bearings)	C–AHH 7593	1
*Anti-roll bar—⅝ in. (15·9 mm.) dia.	AHH 7331	1
*Bearing—⅝ in. (15·9 mm.) dia. anti-roll bar	1B 4526	2
Alternative ¾ in. (19 mm.) dia. anti-roll bar	C-AHH 7924	1

	Part No.	Qty./car
Suspension—*continued*		
Anti-roll bar installation kit	C–AJJ 3306	1
Link—anti-roll bar—R.H.	AHH 6543	1
Link—anti-roll bar—L.H.	AHH 6544	1
Bearing strap	1B 7356	2
Clamping bolt	AHC 146	2
7/16 in. dia. spring washer	LWZ 207	2
7/16 in. UNF. locknut	BHA 4557	2
5/16 in. UNF. × ⅝ in. hexagon head screw	HZS 0505	4
5/16 in. dia. spring washer	LWZ 205	4
½ in. dia. spring washer	LWZ 208	2
½ in. UNF. hexagon head nut	FNZ 108	2
End location stop	AHH 6546	4
No. 10 recessed pan head screw	PMZ 0308	4
Spring washer	LWZ 203	4
Nut	FNZ 103	4
Bottom wishbone assembly—R.H.	AHH 5927	1
Bottom wishbone assembly—L.H.	AHH 5929	1
Parts required to convert early gearbox to large-diameter layshaft and close-ratio gears (NOT SUITABLE FOR 18GD/18GF ALL-SYNCHROMESH GEARBOXES)		
Gearbox casing assembly (overdrive)	48G 314	1
Gearbox casing assembly (non-overdrive)	48G 315	1
Laygear	C–22H 932	1
Layshaft — 22H 571 or	22H 465	1
Thrust washer for laygear (front)	22H 466	1
Thrust washer for laygear (rear) (or 22H 468, 469, or 470)	22H 467	1
Caged needle-roller bearing (for laygear)	22H 471	4
Distance piece for bearing	22H 672	1
First motion shaft (18G/18GA only)	C–22H 472	1
(18GB only)	C–22H 846	1
Second speed mainshaft gear	C–22H 1094	1
Third speed mainshaft gear	C–1H 3300	1
Gearbox dipstick (with sealing rings)	AEC 3683	1
Clutch		
Competition clutch cover assembly	C–BHA 4642	1
Competition clutch driven plate assembly	C–BHA 4519	1
Graphite thrust bearing assembly	27H 2609	1
Graphite thrust bearing retaining spring	22B 66	2

* Parts standard fitment on 'MGB' GT
† Standard fitment 'Tourer' from Chassis No. 108039

Engine	Part No.	Qty./car
Crankshaft (induction-hardened 18GB)	C–12H 2968	1
Main bearing set for hardened crankshaft (18GB)	C–18G 8103	1
Main bearing set (racing clearances) (18G/18GA)	C–8G 8843	1
Packing—oil relief valve spring (standard on 18GB)	AEH 798	1
Valve guide—inlet (Hidural)	C–AEH 755	4
Valve guide—exhaust (Hidural)	C–AEH 756	4
Inlet valve—1 9/16 in. (39·7 mm.) dia. (Nimonic)	C–AEH 757	4
Inlet valve 1 11/16 in. (42·8 mm.) dia. (Nimonic)	C–AEH 860	4
Exhaust valve—1 11/32 in. (34·1 mm.) dia. (Nimonic)	C–AEH 758	4
Exhaust valve—1 7/16 in. (36·5 mm.) dia. (Nimonic)	C–AEH861	4
Valve spring—inner (57 lb. [25·9 kg.])	C–1H 1112	8
Valve spring—outer (140 lb. [63·5 kg.]) double	C–AHH 7264	8
Valve spring—inner (60 lb. [27·2 kg.]) valve springs	C–AHH 7265	8
Valve spring top cup for Nimonic valve	C–AEH 760	8
Valve spring bottom cup and double springs	C–AEH 801	8
Valve collets—pairs (for Nimonic valve)	C–AEH 761	8
Valve springs, triple (set of 3)	C–AHH 7309	8
Valve spring top cup (for triple springs)	C–AHH 7313	8
Valve rocker—strengthened	12H 2037	8
Rocker shaft bracket—front	C–AEH 762	1
Rocker shaft bracket—rear	C–AEH 763	1
Distance piece for rocker—long	C–AEH 764	1
Distance piece for rockers—short	C–AEH 765	2
Tappet adjusting screw (undrilled)	C–AEH 766	8
Tappet (large diameter)	AEC 264	8
Push-rod	C–AEH 767	8
Cylinder head gasket (competition type)	C–AEH 768	1
Crankshaft chain wheel (steel)	12H 244	1
Camshaft (competition) (Stage 3)	C–AEH 714	1
Camshaft—high-lift—wide-period—full race	C–AEH 770	1
Camshaft chain wheel (steel)	C–AEH 771	1
Connecting rod and cap set (18G/18GA only)	C–AJJ 3357	1
Connecting rod bearing set (18G/18GA only)	8G 2259	1
Connecting rod bearing set (18GB only)	C–18G 8022	1
Piston, with gudgeon pin and rings (18G/18GA only) (+·40 in. only). For use with connecting rod set C–AJJ 3357 only	C–AEH 736	4
Piston ring—top	C–AEH 738	4
Piston ring—second and third	C–AEH 854	8
Piston ring—scraper	C–12H 759	4
Gudgeon pin	C–AEH 741	4
Circlip	C–AEH 742	8
Piston, with gudgeon pin and rings (18GB)	C–AEH 853	4
Piston ring—top	C–AEH 738	4
Piston ring—second and third	C–AEH 854	8
Piston ring—scraper	C–12H 759	4
Piston—lightweight forged set (+·080 in. only)	C–AJJ 3375	1

	Part No.	Qty./car
Cylinder head—polished (with valves, etc.)	C–AHT 100	1
Deep sump (18G/GA) no longer available (see pages 38 and 39) Was	C–AHH 7252	1
Deep sump (18GB onwards)	C–AEH 832	1
Packing piece for oil pump strainer (18G/GA)	C–AHH 7238	1
Packing piece for oil pump strainer (18GB onwards)	C–AEH 847	1
Weber carburetter installation		
Carburetter assembly (Weber)	C–AEH 785	1
Weber carburetter installation kit	C–AJJ 3312	1
Contains:		
Inlet manifold complete (for Weber carburetter)	C–AEH 772	1
Stud—carburetter to inlet manifold (long)	C–AEH 775	2
Stud—carburetter to inlet manifold (short)	C–AEH 776	2
Plain washer for stud	PWZ 105	4
Locknut for stud (thin type)	C–AEH 777	4
Stud—steady rod anchor plate to manifold	CHS 2511	4
Stud—throttle cable bracket to manifold	CHS 2511	2
Steady rod complete	C–AEH 778	1
Bolt—fork end to bracket or plate	HBZ 0510	2
Nut—fork end to bracket or plate	LNZ 205	2
Washer—fork end to bracket or plate	PWZ 105	2
Anchor plate—inlet manifold—rear	C–AEH 781	1
Nut—anchor plate—inlet manifold stud	LNZ 205	2
Washer—anchor plate	PWZ 105	2
Anchor nut—steady rod rear plate	C–AEH 843	1
'O' ring—carburetter to manifold	C–AEA 605	2
Nut for carburetter stud	LNZ 205	4
Washer—carburetter stud	PWZ 105	4
Double-coil spring washer	AJD 7732	4
Adaptor union—petrol pipe to carburetter	C–AEH 786	1
Washer for adaptor	6K 638	1
Throttle countershaft—complete	C–AEH 787	1
Bracket—throttle cable abutment	C–AEH 792	1
Washer for stud—bracket to manifold	PWZ 105	2
Locknut for stud—bracket to manifold	LNZ 205	2
Adaptor—Servo brakes	C–AEH 793	1
Copper washer for adaptor	6K 638	1
Throttle link—lever to carburetter—complete	C–AEH 794	1
Throttle cable	C–AHH 7365	1
Throttle return spring	AHH 5621	1
Manifold gasket (induction)	1G 2417	1
Exhaust pipe joint	AHH 6358	2
Flexible petrol pipe	AHH 5544	1

COMPETITION EQUIPMENT

Engine ancillaries	*Part No.*	*Qty./car*
Exhaust manifold (lightweight steel, tuned)	C–AHH 7103	1
Pulley—for dynamo (reduced speed)	2A 864	1
Fan belt (for reduced speed pulley)	13H 923	1
Distributor (Competition tune—Lucas No. 40943A)	C–BHA 4415	1
Engine oil sump (deep type) (18G/18GA) 1 in. (25·4 mm.)	C–AHH 7252	1
Packing piece for pump strainer (18G/18GA) 1 in. (25·4 mm.)	C–AHH 7238	1
Engine oil sump (deep type) (18GB) 1⅜ in.(35 mm.)	C–AEH 832	1
Packing piece for pump strainer (18GB) 1⅜ in. (35 mm.)	C–AEH 847	1
Carburetters—1¾ in. (44·45 mm.) S.U. pair	C–AUD 229	1
Installation kit—1¾ in. S.U. carburetters	C–AJJ 3321	1
including flare pipe	C–AHH 7209	2
Blanking sleeve—thermostat by-pass	11G 176	1
Oil cooler—competition size	C–ARO 9875	1
Oil cooler cover	C–AHT 181	1

Alternative axle ratios

Early tourer only

4·1 : 1 ratio (10/41)	C–ATB 7240	1
4·3 : 1 ratio (10/43)	88G 283	1
4·55 : 1 ratio (9/41)	88G 284	1

Later tourers and G.T.

Ratio	*Teeth*	*C.W. & P. Part No.*	*Differential Cage*	*Limited Slip Diff.*	
3·07	14/43	BTB 900	BTB 840	C–BTB 776	1
3·307	13/43	BTB 841	BTB 840	C–BTB 776	1
3·7	10/37	Not yet available	BTB 866	C–BTB 777	1
*3·909	11/43	BTB 856	BTB 866	C–BTB 777	1
4·22	9/38	C–BTB 975	BTB 866	C–BTB 777	1
4·55	9/41	C–BTB 966	BTB 866	C–BTB 777	1

* 3·909 ratio is at present standard on all 'MGB' axles, which are also fitted with differential cage BTB 866. Differential cage BTB 840 is fitted to the 'MGC'.

Note: Calibrated speedometers for alternative axle ratios are available in km.p.h. or m.p.h. to special order.

OPTIONAL EXTRAS

	Part No.
Overdrive	See Parts List
Wire wheels	See Parts List
Heater	See Parts List
Fresh-air unit	See Parts List
Fog lamp (Export only—Home through BMC Service division)	57H 5593
Headlamp flasher	See Parts List
Twin horns, low note (Export only—Home through BMC Service division)	BCA 4726
Folding de-luxe hood	See Parts List
Tonneau cover	See Parts List
Anti-roll bar	See Parts List
Ashtray (Export only—Home through BMC Service division)	AHH 5539
Front bumper with over-riders (Export only—Home through BMC Service division)	AHH 6917
Luggage grid / Wing mirror (Export only—Home through BMC Service division)	AHH 6946
Wing mirror (Export only—Home through BMC Service division)	27H 9863
Radio	See Trade List
Rear compartment cushion (Export only—Home through BMC Service division)	See Parts List
Cigar-lighter (Export only—Home through BMC Service division)	AHH 7010
Ace-Mercury wheel discs (Export only—Home through BMC Service division) .. .. R.H.	AHH 7044
L.H.	AHH 7045
Long-range lamp (Export only—Home through BMC Service division)	57H 5522
Steering-column locks (Germany, Sweden, Austria)	See Parts List
Hard Top	See Parts List