

1131

# AUSTIN-HEALEY HUNDRED

(MODEL B.N.1.)



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SPECIAL EQUIPMENT AND  
TUNING INSTRUCTIONS

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Healey 100/4 B.N.1  
MR. ENGLISH COBBEN, H1B. 229612

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## SECTION 'A'

## ENGINE

To enable the engine performance to be increased a kit has been produced. This kit was fitted to the Austin-Healey cars that completed the Le Mans 24 hour race in 1953.

Le Mans Engine Modification Kit, Part No. P.280

£132 + Tax

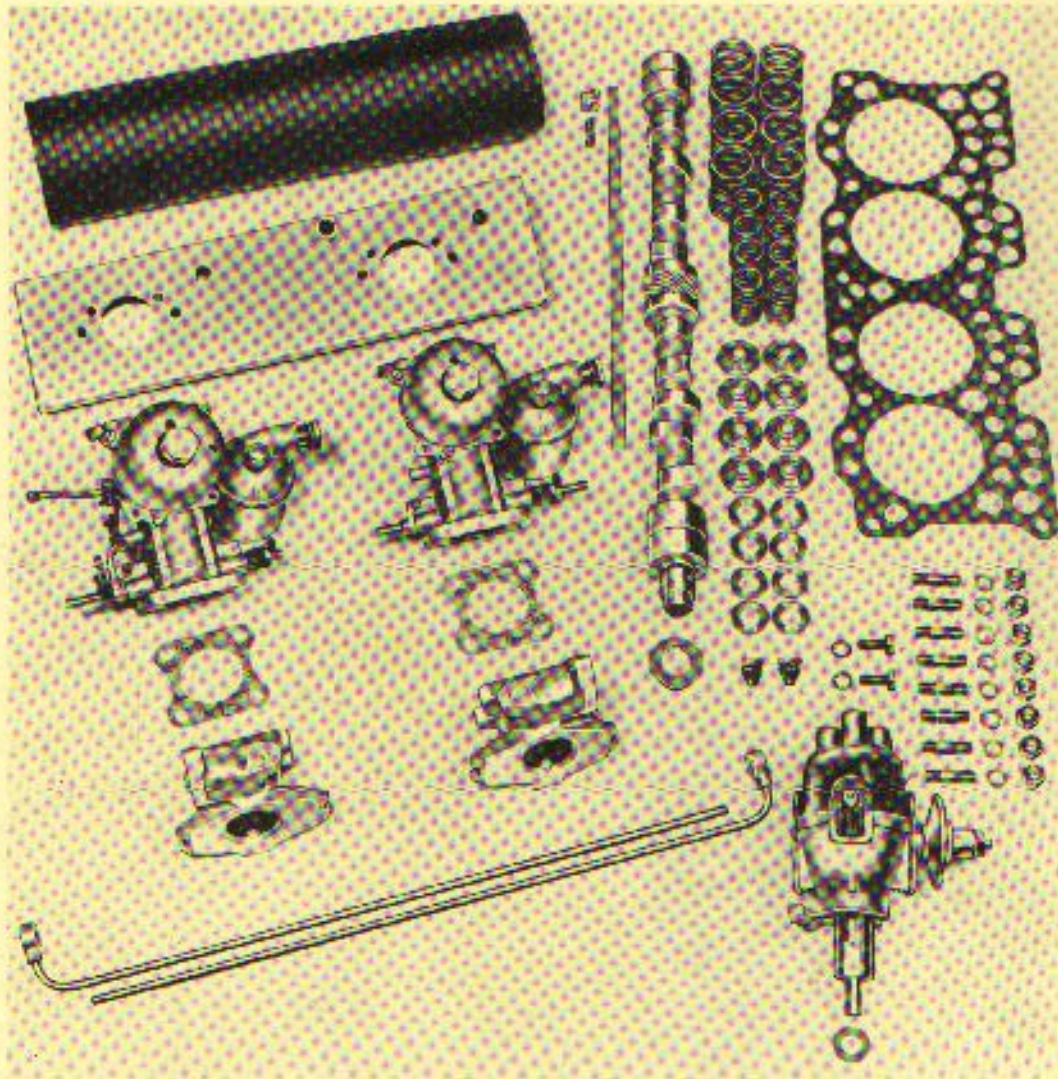
Austin Part No.	Description	Number off
1B.2814	Valve Spring (Outer) .. .. .	8
1B.2813	Valve Spring (Inner) .. .. .	8
1B.2811	Valve Spring Cup (Upper) .. .. .	8
1B.2812	Valve Spring Seat (Lower) .. .. .	8
AUC.9004	1 $\frac{3}{4}$ " Carburetter (Front) .. .. .	1
AUC.9005	1 $\frac{3}{4}$ " Carburetter (Rear) .. .. .	1
1B.2893	Aluminium Carburetter Manifold (Front) .. .. .	1
1B.2894	Aluminium Carburetter Manifold (Rear) .. .. .	1
7H.1733	Carburetter Stud .. .. .	8
7H.1734	Carburetter Gasket .. .. .	2
6K.9688	Nut .. .. .	8
LWN.205	Spring Washer .. .. .	8
7H.1724	Carburetter Cold Air Box .. .. .	1
7H.1725	Carburetter Air Tube .. .. .	1
2H.979	Strip and Buckle Clip .. .. .	1
17H.5247	Grommet .. .. .	2
2K.8479	Set Bolt .. .. .	4
2K.8606	Shakeproof Washer .. .. .	4
1B.2892	High Lift Camshaft .. .. .	1
1B.1219	Tab Washer .. .. .	1
7H.1726	Steel Face Cylinder Head Gasket .. .. .	1
7H.1727	Distributor—Special Advance Curve .. .. .	1
1B.2751	Valve Guide Shroud and Oil Retainer .. .. .	8
7H.1728	Near Side Bonnet Frame Support .. .. .	1
2H.731	Lock Washer for Starting Nut .. .. .	1

\* Auto Carb have Carby's under AUC 735  
1 - Pair £53 50 list + Tax

The Le Mans Engine Modification Kit enables the horse power output of the engine to be increased from 90 B.H.P. at 4,000 R.P.M. to 110 B.H.P. at 4,500.

The effect on performance is marked, and results in improved acceleration and speed. The low speed performance of the engine is not impaired.

Maximum performance will only be achieved by correct and careful fitting of the Kit, and the following installation instructions should be closely followed.



### Fitting Instructions

Drain off cooling water and remove the bonnet, radiator, radiator hoses, cylinder head, carburetters, and manifolds. Drain off engine oil and withdraw oil reservoir, oil pump, and distributor. Remove engine mounting bolts (4 at each mounting), detach tappet cover, and withdraw the tappets.

Extract the crankshaft pulley, take off the timing case cover, remove camshaft gear and chain, and withdraw the camshaft itself.

Next, strip the cylinder head and carefully smooth off any roughness within the combustion chambers and ports.

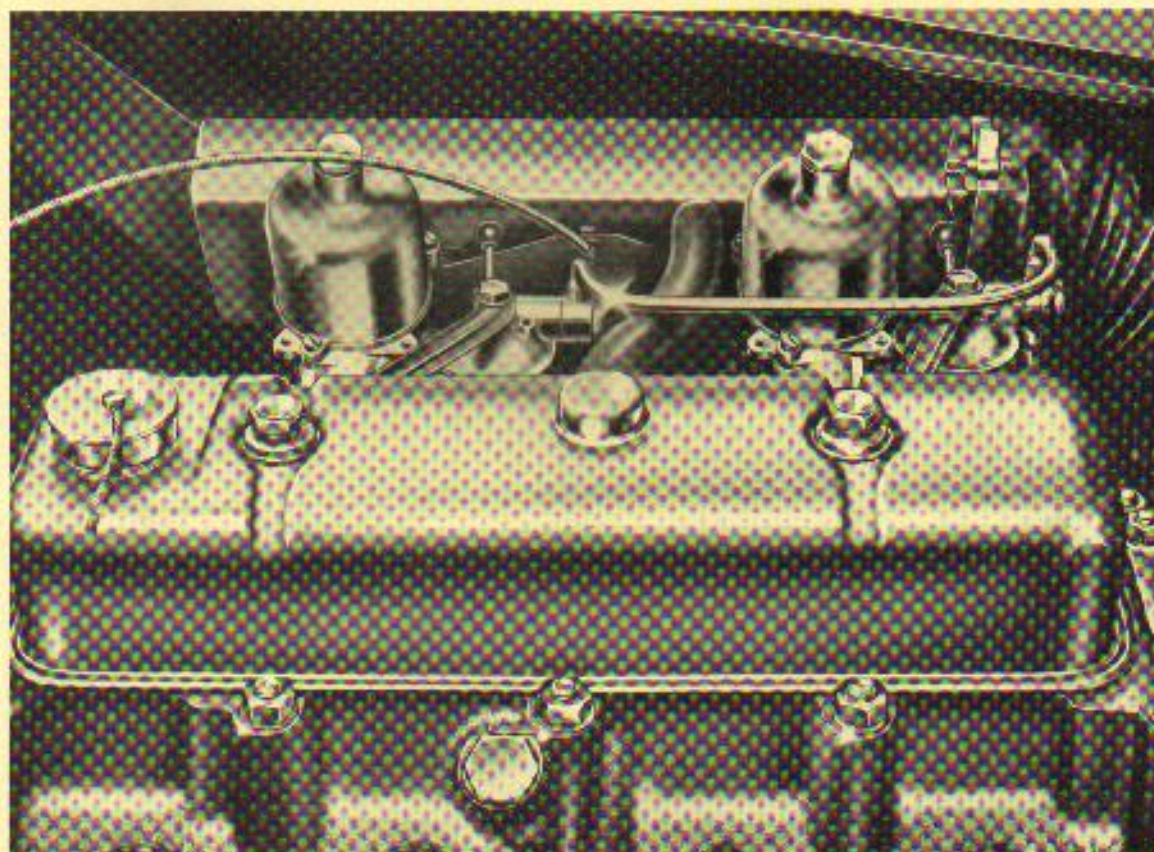
Match and fit the inlet and exhaust manifolds and carburettors to ensure that no steps exist at the joints. It is important that the carburettors are carefully aligned so that the spindles are in line and the mechanism returns freely to its stops.

The valves should be lightly ground in until perfect seatings are obtained. Fit the special camshaft, chain and gear, ensuring that the valve timing markings are correctly lined up. Refit the distributor with the timing set at  $9^{\circ}$  B.T.D.C.

Rebuild the engine and set the tappets to  $.015''$ . Refill the radiator and oil reservoir, and when the engine has warmed up, re-tighten the cylinder head nuts and check the engine and cooling system generally for leakages. Cylinder Head should be tightened to 65/70 lbs.

A road test is now essential for final adjustment, and it is recommended that the most satisfactory ignition setting is arrived at by timing top gear acceleration against a stop watch.

Under no circumstances should any attempt be made to raise the compression ratio by machining the cylinder head.



## A X L E

The standard production axle ratio is 4.125 (8/33) an alternative 3.667 (9/33) axle ratio is available as an extra. There are three possible overdrive ratios permitting a selection of six Overdrive Top Gear Ratios. The Overdrive ratios are 22%, 28% and 32%.

### Rear Axle and Overdrive Combinations

- (a) 4.125 Axle with .778 Overdrive = 3.21 Overdrive Top Ratio
- (b) 4.125 Axle with .756 Overdrive = 3.12     "     "
- (c) 4.125 Axle with .820 Overdrive = 3.38     "     "
- (d) 3.667 Axle with .778 Overdrive = 2.86     "     "
- (e) 3.667 Axle with .756 Overdrive = 2.77     "     "
- (f) 3.667 Axle with .820 Overdrive = 3.01     "     "

It will be readily seen that this selection permits a variation to be made to suit most conditions. The road speed calculations have been based on the Dunlop Road Speed Tyre inflated to a pressure of 29 lbs./sq. inch (2.039 kg./cm<sup>2</sup>).

An allowance has been made for tyre increase in diameter which occurs at the higher speeds.

### Relationship of Road Speed — M.P.H. to Engine Speed — R.P.M.

4.125 Axle					3.667 Axle			
M.P.H.	Direct Top	.820D	.7780D	.7560D	Direct Top	.820D	.7780D	.7560D
120	—	—	5000	4850	—	4700	4500	4350
115	—	—	4800	4650	—	4500	4300	4150
110	—	4850	4600	4450	—	4300	4150	4000
105	—	4600	4400	4250	5000	4100	3950	3800
100	—	4400	4200	4050	4750	3900	3750	3600
95	—	4200	3950	3850	4550	3700	3550	3400
90	4800	3950	3750	3650	4300	3500	3400	3250
85	4550	3750	3550	3450	4050	3300	3200	3050
80	4300	3500	3350	3250	3800	3100	3000	2900
75	4000	3300	3100	3050	3600	2900	2800	2700
70	3750	3100	2900	2850	3350	2700	2600	2500

The selection of a ratio for a particular course is a difficult matter and it can make a very great difference to lap times. Grand Prix Racing Teams usually take a selection of ratios to course and try them out in practice to choose the best ratio. This is an expensive process and is generally difficult due to the available time.

Our recommendations are based on the Austin-Healey with Le Mans Engine Kit and single aero screen.

High speed circuits with long straights such as Le Mans and Reims:

3.667 axle and .778 overdrive

Fast circuits such as Sebring and Silverstone full circuit:

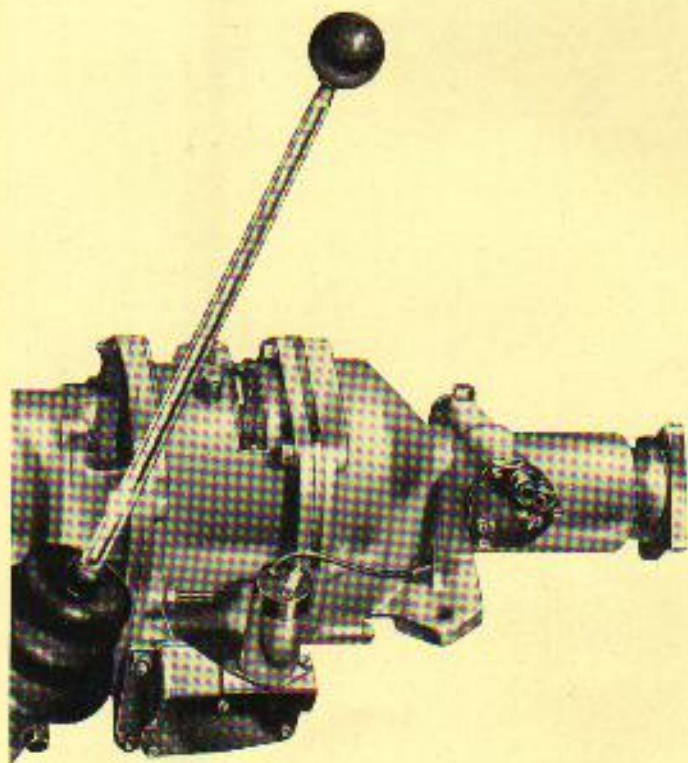
3.667 axle and .820 overdrive

Short distance aerodrome circuits with many corners and short straights:

4.125 axle and .820 overdrive

Sprint events such as Standing Kilometer:

4.125 axle and .820 overdrive



*Austin  
Part No.*

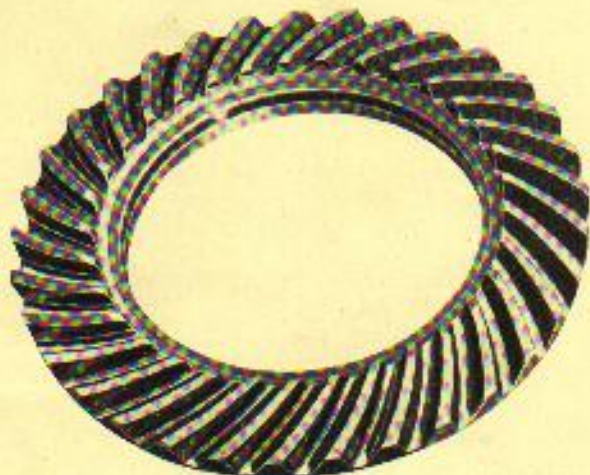
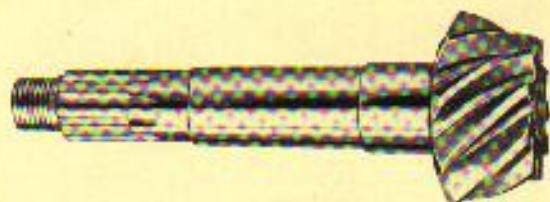
1B.3691 .. .778 Overdrive Assembly  
28.6%

7H.1735 .. .820 Overdrive Assembly  
22%

1B.3651 .. .756 Overdrive Assembly  
32%

1B.3642 .. Overdrive Gasket

B3-365 .. }  
3.667 Axle Ratio  
Crown Wheel  
Pinion



In general the 3.667 axle and .820 overdrive is the most suitable combination for racing. The gearing should be such that 4,500 R.P.M. is reached on the straight. The engine should not be allowed to exceed 4,800 in racing. The 3.667 axle ratio has an advantage over the 4.125 as it gives a higher speed in direct gear.

The overdrive governor on centrifugal switch should be shorted out for racing. This is quickly done by putting a lead between the two terminals of the switch. This switch is located on the extreme rear end of the overdrive.

The use of .756 overdrive and 3.667 axle ratio is not recommended as the overdrive top is too high for all circuits in use to-day.

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## SECTION 'C'

# S U S P E N S I O N

For competition work and continental touring a stiffer suspension is generally desirable. We have developed a stiffer suspension the fitting of which increases cornering power and stability. This consists of:—

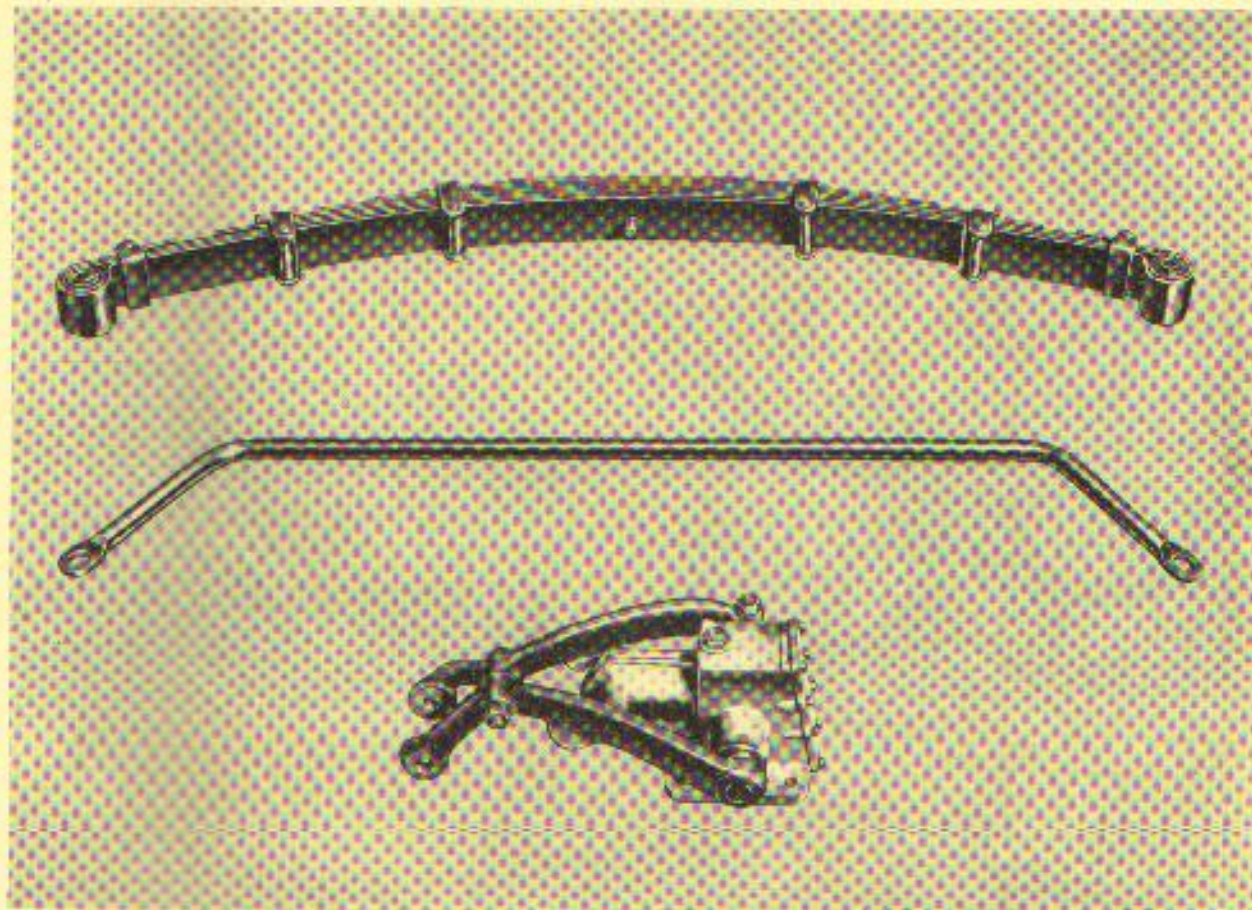
### *Austin Part No.*

1B.8935	..	Harder front shock absorbers (Standard equipment from Chassis: L.H.D. 153855 on R.H.D. 153857 on)
7H.1721	..	Stiffer anti-roll bar
1B.8929	..	Stiffer rear springs (Standard equipment from Chassis: L.H.D. 152233 on R.H.D. 152420 on)

For most competition work the Dunlop Road Speed Tyre is satisfactory. For severe Racing conditions the Dunlop 550 x 15 R1 Racing tyre should be fitted.

The recommended tyre pressures for competition work are 26 lbs./sq. in. Front. 29 lbs./sq. in. Rear. Drivers may wish to alter pressures to suit their own tastes. The tyre manufacturers representatives if present will generally advise on pressures.

Always have sufficient fitted spare wheels available balanced and at the correct pressures for changing.



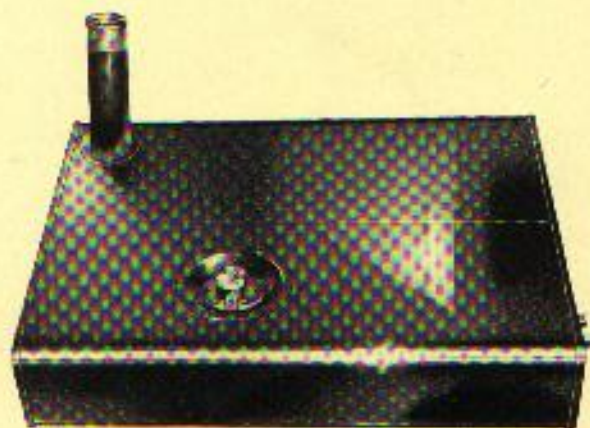
The race type rear spring is fitted with safety leaves.

## SECTION 'D'

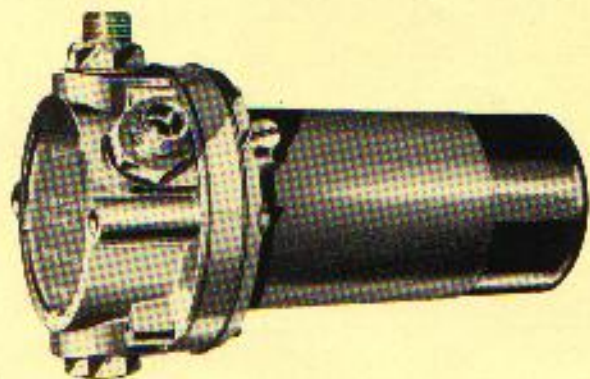
# PETROL TANK AND FUEL SUPPLY

The standard Tank is suitable for most normal purposes. We have developed two alternative petrol tanks. The 15 gallon tank is intended to provide a greater range and a reserve system. The 25 gallon tank is designed for particularly long distance races with a stipulated minimum distance between refuelling beyond the capacity of the 15 gallon tank. The 15 gallon tank is about 1 in. deeper and loses very little luggage space. The 25 gallon tank occupies nearly all the available luggage space.

The reserve fuel system is operated by an extra petrol pump and switch.



### *Austin Part No.*



- |         |    |                              |
|---------|----|------------------------------|
| AUA.36  | .. | Petrol Pump                  |
| 7H.1714 | .. | 15 gallon Petrol Tank        |
| 7H.1715 | .. | 15 gallon Petrol Tank Straps |
| 7H.1716 | .. | 25 gallon Petrol Tank        |
| 7H.1717 | .. | 25 gallon Petrol Tank Straps |
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## BR A K E S



Good braking adds greatly to performance and the pleasure of driving. It is important before racing to be certain that the brakes are giving the best possible performance.

The brakes are Hydraulic with two leading shoe front. Adjustments should be carried out in accordance with instructions.

It is important if the brakes are new or have just been relined that they are used very gently until a perfect bedding is obtained. Do **NOT** apply new brakes fiercely or the drums and linings will be damaged and the braking efficiency impaired.

If new drums have been fitted, these drums must be used gently until the brakes and drums are correctly bedded.

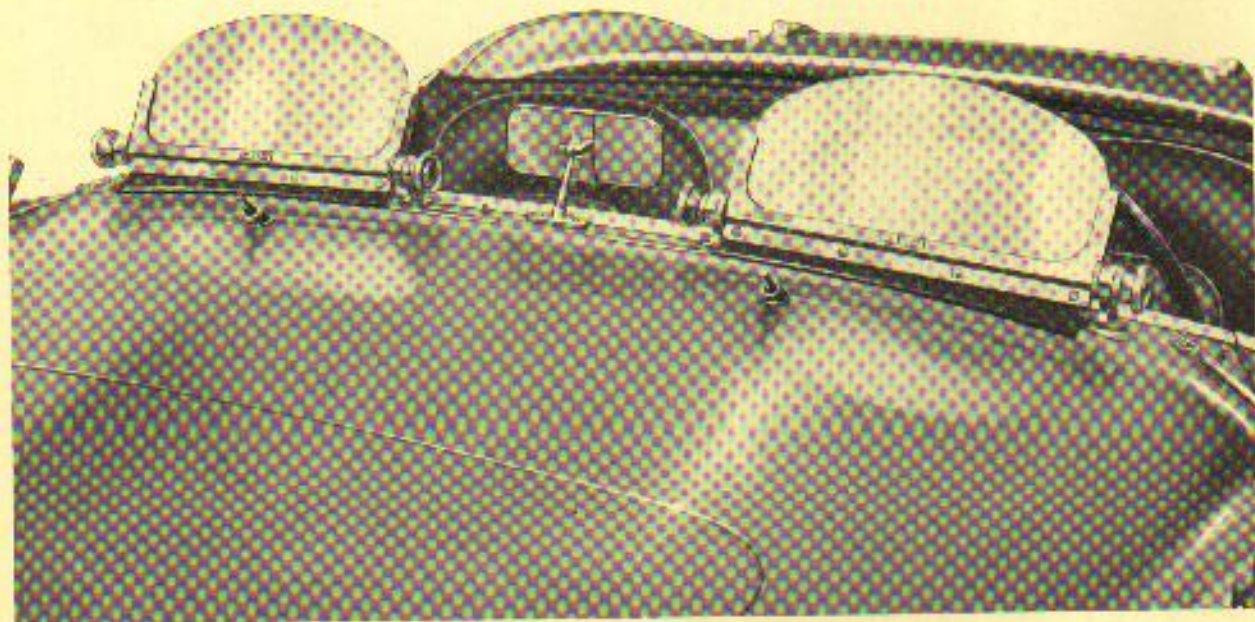
Part No. 7H.1719 — Alfin Brake Drums — are available. These save weight and improve heat dissipation. The drums are ribbed for cooling and strength.

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SECTION 'F'

## AERO SCREENS

Aero Screens have been designed specially for fitting to the Austin-Healey. The screen incorporates a rubber seal at the lower edge which prevents water running under the screen.



*Austin  
Part No.*

7H.1713 .. Aero Screen Assembly .. .. 2-off

The Aero Screens are fitted with approved laminated safety glass.

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## SECTION 'G'

# ELECTRICAL

The security of electrical wiring for competition purposes is very important. It is advisable to install a second coil in position ready for a quick change over in the event of failure.

Always carry spare bulbs and fuses.

The importance of the correct contact breaker point setting of .015" cannot be overstressed.

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## SECTION 'H'

# GENERAL

Particular attention should be paid to all adjustments and tightness of nuts and bolts.

- (1) Check and set toe-in correctly; this avoids undue tyre wear.
- (2) Check engine, axle and gearbox for oil leaks and replace any faulty gaskets.
- (3) Check the tightness of oil filter and bolts. For added security bolts may be drilled and wired.
- (4) Grease the splined and cone surfaces of wheels and hub nuts before fitting.
- (5) Clean the petrol filters in the pump and the carburettors and replace with the nuts tight.
- (6) Tape the radiator hoses with friction tape.
- (7) Do not attempt to race a new car. Peak performance will not be obtained until approximately 3,000 miles have been covered.
- (8) Make a point of changing all oils before a race. This ensures that any dirt is removed from the working parts and the lubricant is in the best possible condition.

- (9) Spare wheels should be checked so that replacement tyres at the correct pressure are available.
- (10) Always have supplies of water and the correct oil available.

### Spares

Certain races stipulate that all spares and tools are carried on the car. The carrying of spares on rallies and long distance road competitions is advisable. A series of spares has been developed which weigh little, but can be invaluable. They are as follows:—

- (1) Coil of soft steel wire. Very useful for wiring on parts that come loose as the result of vibration or accident.
- (2) Spare spark coil. Should be fitted in position for a quick change.
- (3) Set of spark plugs correctly gapped and carefully packed for use.
- (4) Spare fan belt.
- (5) 4 — 50 amp. fuses.  
2 — Panel light bulbs  
1 — Side or tail lamp bulb  
2 — Headlamp bulbs
- (6) 1 Cylinder head gasket.
- (7) 1 Roll of friction tape.
- (8) 1 Contact breaker set.
- (9) 1 Chamois leather.
- (10) 1 piece of rag.

You are then equipped to deal with a large number of minor troubles that could put you out of a race, but which are so easily put right.

### Tools

- (1) Hammer to remove wheel nuts.
- (2) Lifting jack well greased for quick action.
- (3) Pliers.
- (4) Adjustable spanner.
- (5) Spanners.
- (6) Screw drivers.

## **Weight and Wind Resistance Reduction**

Performance is affected by weight and wind resistance.

The car as supplied is fitted with all weather equipment for touring purposes. For racing it is suggested that the following items are removed:

- Bumpers and bumper irons.
- Windscreen and side curtains.
- Hood.
- Tools if not required by regulations.
- Heater.
- Radio if fitted.
- Windscreen wiper.

The screen may be quickly removed by taking out the two screws on the inner face of the feet. It is then possible to fit the aero screen. This aero screen is designed so that the attachments may be left in position with the normal screen. The passenger seat should be covered with the tonneau.

It is advisable that all wiring and connections are checked before a race. Particular attention should be paid to connections behind the panel, battery and starter leads.

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## SECTION 'I'

## LIST OF AVAILABLE EXTRA EQUIPMENT

<i>Austin Part No.</i>	<i>Description</i>
P.280	Le Mans Tune-up Kit.
7H.1713	Aero Screen Assembly.
7H.1714	Petrol Tank, 15 Gallons.
7H.1715	Petrol Tank Strap.
7H.1716	Petrol Tank, 25 Gallons.
7H.1717	Petrol Tank Strap.
7H.1719	Alfin Brake Drums. <i>7H1825 in Paris</i>
1B.8929	Race Type Rear Springs (Negative Camber). (Standard Equipment from Chassis L.H.D. 152233 on R.H.D. 152420 on)
7H.1721	Race Type Anti-Roll Bar.
7H.1735	Close Ratio Overdrive Assembly (22%).
ALT-83	Waterproof Plug Covers.
7H.1747	Silencer (Race Type).
1B.8935	Front Shock Absorber (Standard Equipment from Chassis L.H.D. 153855 on R.H.D. 153857 on)
B3-365	Crown Wheel and Pinion (3.66 to 1).
7H.1751	Speedometer for use with B3-365.