COMPETITION PREPARATION MANUAL

MGB

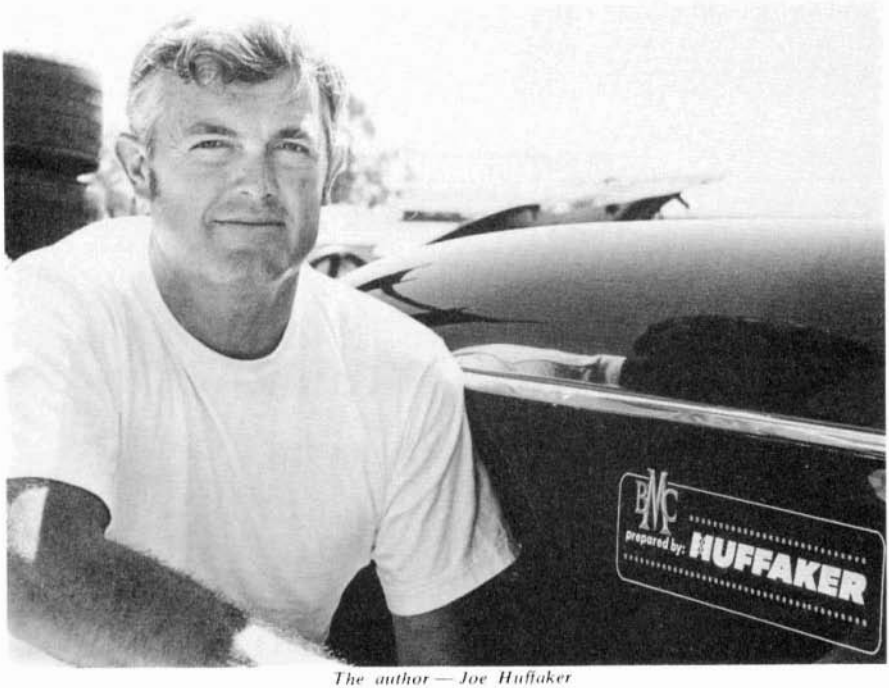
1st EDITION

COMPETITION PREPARATION FOR THE MGB

by **J. W. HUFFAKER**

of

HUFFAKER ENGINEERING CO.



The author — Joe Huffaker

The BMCD/Huffaker MGB in action with Merl Brennan at the wheel.

CONTENTS

PAGE

Introduction 4

Foreword 5

Section I

Engine Modifications 5

Section II

Setting Up Suspension & Chassis 22

Section III

Specifications — Standard & Competition 26

Appendix I

British Leyland Competition Parts List 34

Appendix II

Huffaker Engineering Parts List 37

INTRODUCTION

Many of our readers have no doubt read the Factory Special Tuning Booklet, AKD 4034, which contains much valuable information for stage tuning and competition preparation of the MGB. However, here in the U.S.A. we felt the need for a comprehensive tuning book prepared specifically for S.C.C.A. driving. In this book written by Joe Huffaker, who is without question one of the greatest authorities in the U.S.A. on the competition preparation of the MGB; you will find a wealth of information which will enable you to build a competitive and reliable car.

However, do not attempt to follow any of the procedures outlined in this book without a copy of the Workshop Manual and a mechanical parts list. Take particular notice of the instructions regarding ordering competition parts, which appear at the head of Appendix I and II. All procedures and parts listed are legal under the S.C.C.A. rules for the 1970 competition season. When further changes to the rules take place, amendment to this book will be made.

This Department will not knowingly advise any modifications contrary to the regulations. It is, however, the responsibility af each and every driver to ensure that his car conforms with the S.C.C.A. regulations. British Leyland Motors Inc., its Dealers and Distributors, and Huffaker Engineering cannot be held responsible for any protests or disputes resulting from illegal modifications or parts.

Modifications of the type described in this book and/or the use of your vehicle for competition render the manufacturer's warranty null and void.

If technical assistance is ever required, do not hesistate to contact the writer, as one call or letter may save you many hours of frustration or prevent you from damaging an expensive part.

MICHAEL J. R. BARRATT
Competition Technical Advisor
British Leyland Motors Inc.
600 Willow Tree Road
Leonia, New Jersey 07605
(201) 461-7300

FOREWORD

The contents of this preparation manual are derived from several years of campaigning the MGB sports car, and countless hours of dynamometer testing and development work on the MGB engine. I will endeavor to include all of the **important** steps and preparation of the winning MGB in the following text.

British Leyland Motors Inc., its Distributors, Dealers, and Huffaker Engineering will not be held responsible for damage or injury which may occur in the following of any procedure outlined in this book.

SECTION I

ENGINE MODIFICATIONS

I. Preparation of the Engine Block

The MGB cylinder block is an excellent casting made of close grain cast iron. It is more than adequately strong for the amount of horse power which we are able to extract. The first step in preparing the cylinder block for racing, would be to debur the interior of the block, taking great care not to damage the crank shaft main bearing bores or the cam bearings. An inspection should be made in the tappet gallerys to assure that there are no loose particles or casting flash which may drop off at a later date causing damage to the interior of the engine. These can be very easily removed with a porting tool and deburring stone. Prior to boring for your oversized pistons, the block should be checked to make sure that the block surface is parallel to the crank-shaft line bore. The block may now be bored.

It is a good idea to leave at least .0003″ to .0004″ for a final hone job to get the proper cross hatch finish for proper ring seating. We suggest a bore clearance of .006″ for cast pistons, and .0075″ for the forged pistons. Final honing should be done with a 200 to 250 grit stone used with honing oil and kerosene. This must be done in such a manner as to give a proper cross hatch pattern on the cylinder walls.

On the MGB engine, the exhaust valves overhang the edge of the cylinder block making it necessary to cut a relief in the block for the exhaust valve clearance. This can be done very simply by scribing the cylinder block surface using the competition head gasket for a guide. Dycum may be painted around the cylinder bores to facilitate the layout. The line should be scribed so that it is 1/16th of an inch inside the gasket. After removing the head gasket, a relief can be ground in the cylinder block at approximately a 45 degree angle down into the cylinder. This is to be ground in the area under the exhaust valve only. Care must be taken to not exceed a depth of .200″, as any greater depth would allow the combustion flame to be directed on the top ring during the firing cycle. This would cause severe ring damage and ring land breakage. It is possible to make this relief with a fly cutter using the exhaust guide as a

pilot. However, we do not suggest this method. The 45 degree chamfer not only clears the exhaust valve but also gives a better gas flow during the exhaust cycle.

After all the machine work has been completed, the bronze plugs at the end of the oil gallerys should be drilled and tapped to a 5/16″ coarse thread. This will facilitate the extraction of the plug by use of a slide hammer gripping on a bolt threaded into the plug. After removal of the plugs, the entire block should be degreased. As a final clean-up, detergent and hot water should be used to scrub the block, especially in the cylinder bores. It is advisable to use a high pressure hot water column through the oil gallerys followed by a thorough scrubbing with a percolator brush or similar type brush. Follow this up with another flushing with hot water. New plugs can now be pressed into the oil gallerys making sure that they are all **slightly** below the surface so they do not interfere with proper gasket sealing on the sump and end covers during the final assembly. It is advisable, after washing the block with detergent and water, that it be air dried and immediately sprayed with an anti-rust solution such as WD40. Rust will form almost immediately on the fresh cast iron after a thorough cleansing. Core plugs should be removed prior to cleaning and replaced with either a bolt-in type core plug or new stock core plugs which should be sealed with an epoxy cement. The seating surface for the core plugs should be thoroughly cleaned prior to the installation of the new part. A wire brush in an electric drill works well here.

The setting of the deck clearance should be carried out in the following manner: First, install the crank shaft and all of the main bearings and torque them to their proper torque settings. Install the connecting rod and piston assemblies using one old or used top ring only. This will stabilize the piston and make your measurements considerably easier. Of course, the rod and piston assembly must be aligned prior to the installation in the cylinder block for this checking purpose. The rod alignment is best accomplished by putting it into the hands of an experienced automobile machinist. The rod and piston is checked as an assembly by using a Sun or other good testing fixture. The rod and piston assembly is checked to give perfect vertical alignment and also to check for twist in the rod.

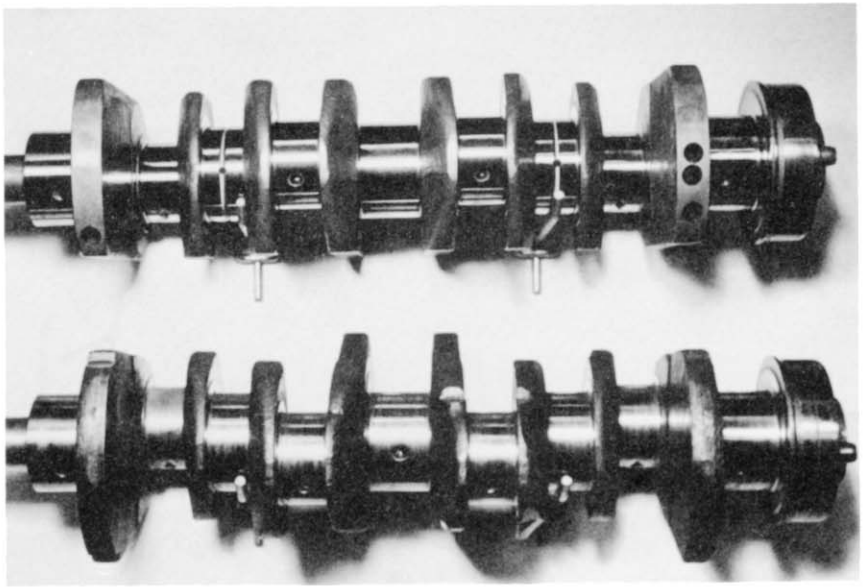
Using a dial indicator, rotate the crank shaft so that the piston is at top dead center. Checking with the indicator, rotate slightly back and forth until an absolute zero reading is found. At this time it would be wise to check your T.D.C. timing; mark on the front crankshaft damper; correct if not **dead on.** Now, using a depth mike, carefully check the distance from the top surface of the block to the top of the piston. In this case, a zero deck to a minus .002″ would be the optimum height for the flat top piston. If your measurements show the piston to be .015″ low, for instance, it would be necessary to mill the cylinder block an amount bringing the deck height to zero. On the other hand, if the piston were above the block by .015″ or so, a similar amount would have to be removed across the head of the flat top piston.

Setting the deck height with a dome-type piston, a somewhat different

method must be used to find the deck height. In this case, we use a magnetic base with a dial indicator. This base is set on the top of the block with the dial indicator tip next to the cylinder bore but resting on top of the block. The dial indicator is then set at zero and gradually moved toward the bore until the tip of the dial indicator drops down to the edge of the piston. Always check at a point in line with the wrist pin. This reading again should be zero to minus .002″ for the deck height. It is very important, however, to use the smallest possible tip for your dial indicator.

II. Crankshaft Preparation

The standard crankshaft is adequate in strength for competition use. It is advisable, however, to make some modifications to insure good bearing life and increased crankshaft life. When crankshaft speed above 6500 rpm is required, it is advisable to cross drill and groove the crankshaft to give full oil feed to the number two and three rod journals, as illustrated in figure I. On the standard crankshaft, the main bearings, numbers 2 and 4, are not drilled. They are fed oil through the cylinder block gallerys but do not, in turn, feed the intermediate rod bearings. This is adequate for normal use for speeds up to 6500 rpm. To further increase the strength of the crankshaft and give a harder and better bearing surface, the crank should be first ground to .006″ undersize then nitrited by a **competent** heat treater and then reground to .010″ undersize. This

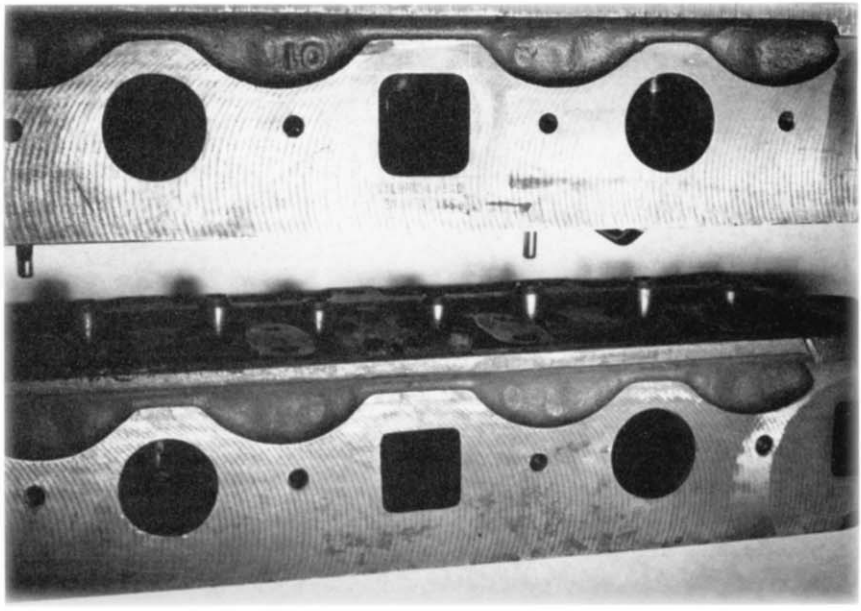


will allow you to correct any error in index or size at this time. A crank treated in this fashion will give excellent service and should last several seasons of racing if given reasonable care. The finished grind on the crankshaft should give a rod bearing of to .0025" and the main bearing clearance of to .003". The standard B.M.C. bearings are made by Vandervell and are excellent for competition usage. The part numbers for these bearings are listed in our parts list under Item HAE 286—rod, and HAE 287-main. Reworked crank shaft is HAE 285.

III. Cylinder Head Preparation

The first step in the preparation of the competition cylinder head consists of a careful inspection of the entire head casting taking special note of the condition of the valve seats, both intake and exhaust. It is adviseable to check these areas by use of magnaflux prior to starting your port and polish job on the cylinder head. The porting of the cylinder head must be approached with great care. (Do not try to lighten your car by removing vast quantities of cast iron from the ports. This will only look impressive on the work bench, not on the dynamometer.)

Step 1. Use a standard gasket to scribe the exhaust and intake port shape on the cylinder head. A sharp scribe and the head coated with machinists' Dycum will help here.

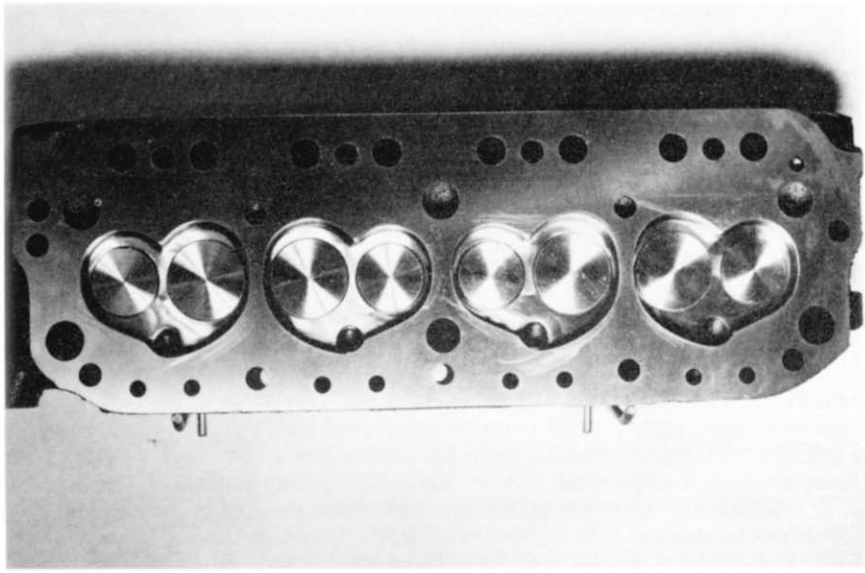


Step 2. Using a carbide burr, preferably ⅜″ diameter, rough out the exhaust ports to just inside the line you have scribed on the cylinder head. Using the same tool, work gradually up the port toward the valve taking care not to change the basic shape. The port should be ground out or opened approximately 1/16″ all around.

Step 3. Carefully grind the boss for the valve guides so that it is flush with the base of the port, and also open up this area, 1/16″ all around. This is a critical area. Do not cut close to the valve seat. Stay at least ¼″ below the seat while doing your grinding. In the valve pocket, a ⅞″ or 1″ round stone may be used to blend in the valve pocket to the port area.

Step 4. Remove approximately 1/16″ material throughout the intake port, trying to retain its original shape. Remove the guide boss here also and blend the valve pocket in with a 1″ ball stone after the carbide burr has removed most of the metal. Do not open up the valve seats. Fig. II.

Step 5. Use an 80-grit then a 120-grit drum sander to finish off the ports to a smooth surface. 120-grit is fine here as a **highly polished** surface does not help. Our main objective in the ports is to have a **smooth, even, non-obstructed surface** for the air to flow. It is not necessary to have a mirror finish.

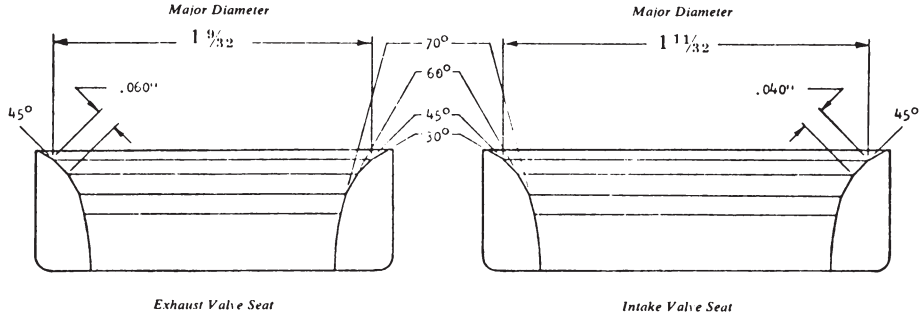


Step 6. The combustion chambers should be lightly polished to remove all rough casting marks and imperfections. Do not remove any unnecessary material here as it only lowers the compression ratio. Very little can be gained in air flow by excessive grinding in the combustion chamber. (See Photo #3.) Take care to leave all chambers **equal** in displacement.

Step 7. Install the hidural valve guides, item AEH 757—intake, and AEH 861—exhaust. Rough-cut the valve seats at 45 degrees. Use a pair of layout dividers to get the outside seat diameter. The seat should be .005″ to .010″ smaller than the valve head diameter. A 25-degree narrowing stone should be used to bring the 45-degree seat diameter to its proper outside diameter. A 60-degree stone is then used to get the proper inside diameter leaving a seat width of .060″ for the intake valve and .080″ for the exhaust valve. A 70-degree reamer is next used to blend the 60-degree cut into the valve pocket. The average width of the 60-degree and 70-degree cut is about .070″. This can be blended in later with a sanding drum, 120-grit, being **very careful** of the valve seat area. Finally, a 45-degree finishing stone should be lightly touched to all seats to give it a final, **perfect finish.** Of course, all valves should be exactly the same depth to insure an even compression ratio.

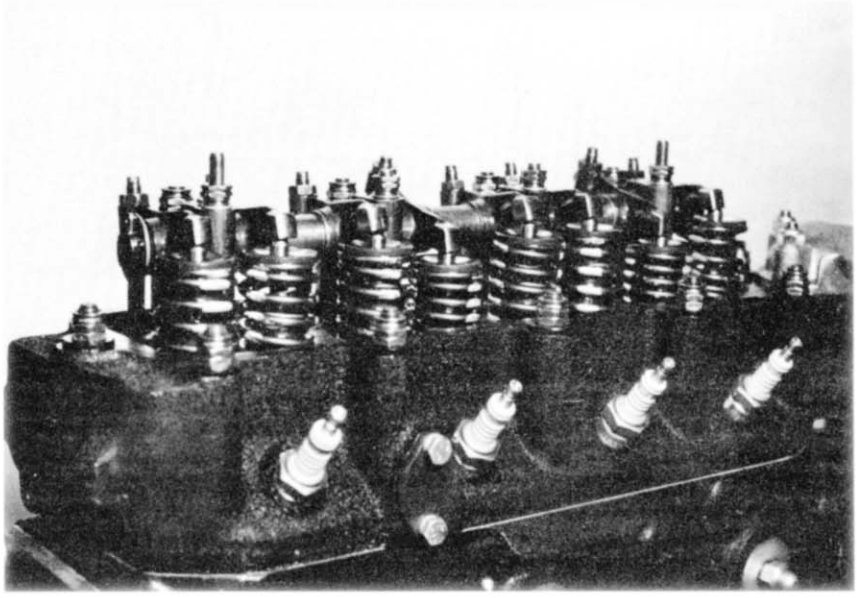
Step 8. The valves should then be lightly lapped on their seats and marked for their individual positions. The valves then should be removed and using a 37½-degree angle on the valve facer, remove the material

MGB VALVE POCKETS



below the seated area to within .005″ to .010″ of the seated area on the valve. The following illustration will show the seat angles for both the valve seat and the valve itself:

Prior to the installation of the valves and springs, it is advisable to machine the intake guides to take the teflon-stem seals, listed as Item HAE 289. The valves should be installed with the proper springs installed depending on which cam shaft you have selected. The spring and collar sets are shown as Item HAE 260 or HAE 265. After the assembly of the valves, springs and collars, each valve stem should be checked individually for length and ground so that the entire set of valves has **identical** valve stem lengths.



The combustion chamber volume should be 36.5 cc's, to achieve a 12.5 to 1 compression ratio. This usually necessitates milling the cylinder head between .080″ and .100″. The same compression ratio of 12.5 to 1 can also be achieved by using a stock head thickness and our dome configuration pistons. These pistons will have a 6½″ radius dome and the cylinder head must be machined to conform exactly to the piston dome. One advantage in the dome piston design is that the milling is not required. This leaves the cylinder head deck in much more rigid condition.

To prolong head gasket life, when using very high compression ratios, the cylinder head **may** be O-ringed. A 20-gauge copper wire around the periphery of the cylinder head gasket is used. This wire protrudes .008″

above the surface of the head and compresses in a localized area so that there is no possibility of head gasket leakage. This machine work must be done in a pantograph using a suitable template for the individual job. Complete head listed as Item HAE 225.

IV. **Oil Pump and Sump Modifications**

The oil pump has plenty of capacity but at extremely high rpm may have a tendency for the pressure to drop off due to cavitation in the pump. This can be prevented by machining the pump cover and making twin inlet ports to the pump, as shown in our following illustration:

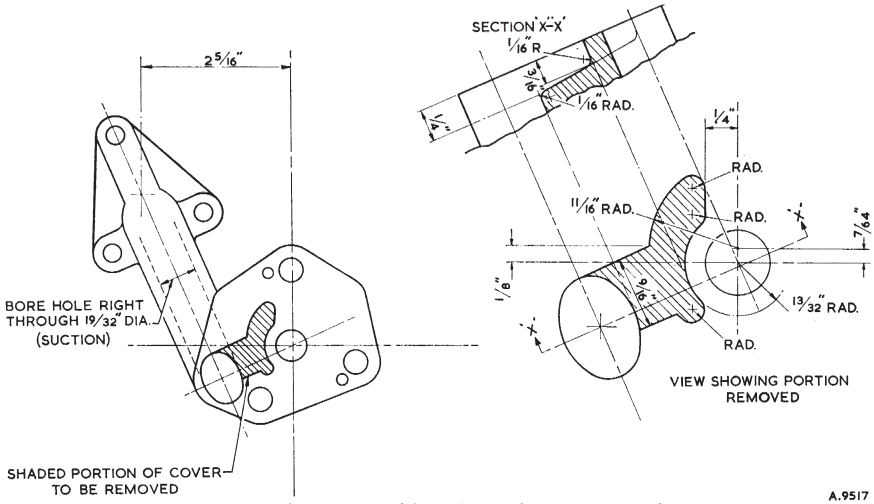
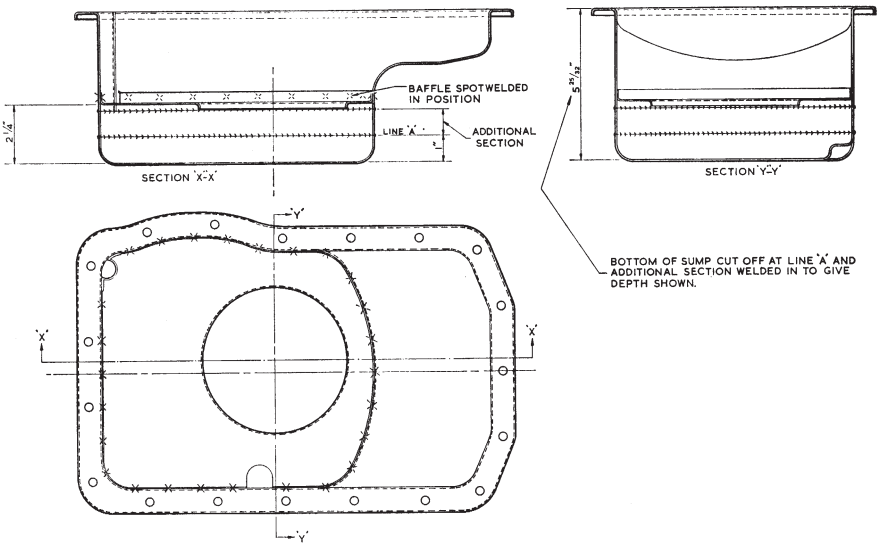


Diagram showing portion of the 18G/18*GA oil pump cover removed*
Note. Part of this machining is already incorporated on 18*GB engines*

It is normally unnecessary to shim the bypass valve spring to increase oil pressure, but this can be done by placing a circular shim inside the thimble at the spring. It is desirable to run 60 lbs. pressure at all times with oil temperature in the area of 200 degrees Fahrenheit.

The standard oil pan may be used by adding the special surge baffle as illustrated. For all-out competition use, I suggest adding 1⅜" to the depth of the stock pan and also adding the same baffle, as illustrated. This is done by cutting the lower portion of the pan at a line 1" up from the base. This must be done very carefully to assure an even line around the periphery of the pan. A strip of 18-gauge steel, 1⅜" wide should then be tacked in place approximately every 2 inches until the entire band is attached around the circumference of the pan base. Do not attempt to weld this in place unless it is attached securely to a cylinder block, otherwise warpage and misalignment of the pan will occur. A slight improvement in oil flow will result from the modifications to the oil filter. See the following drawing. #4 Drawing.



Details of the increased-capacity oil pan

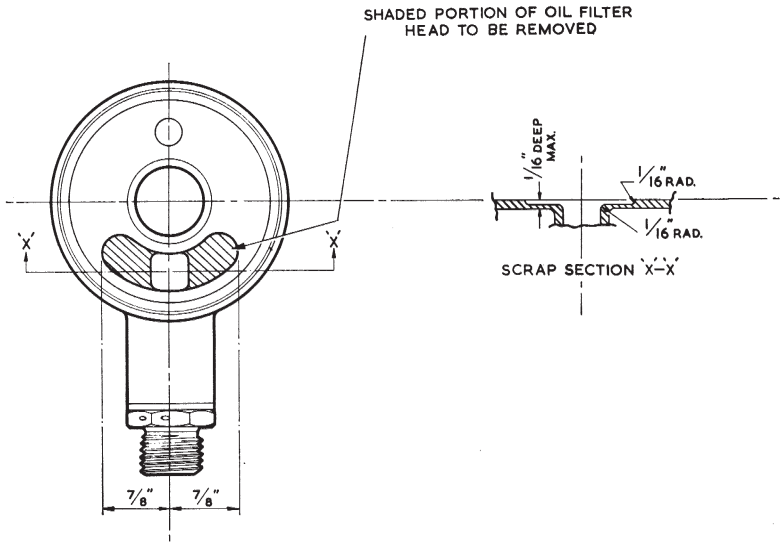
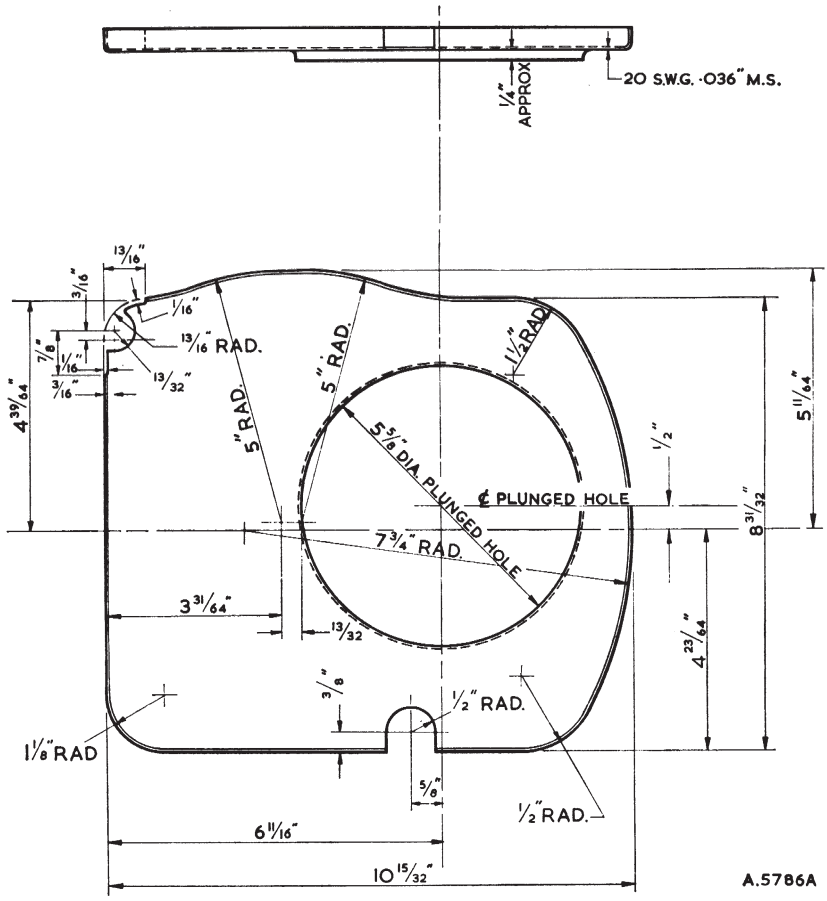


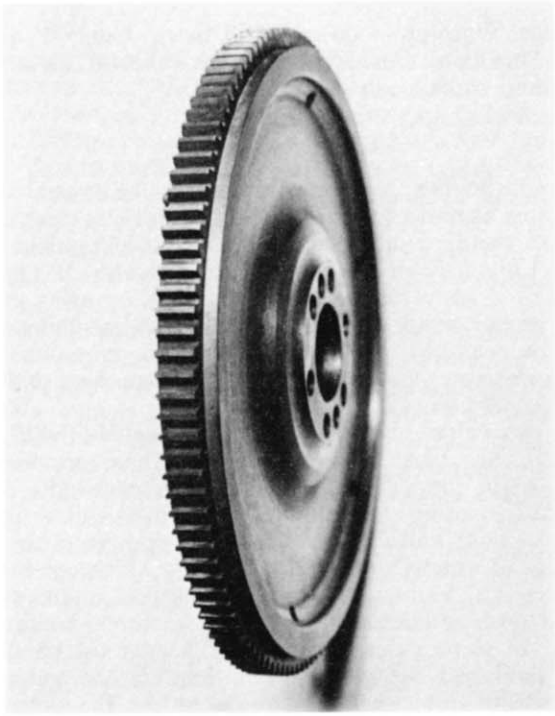
Diagram showing portion of oil filter head removed



Detail of oil pan baffle plate

V. **Flywheel**

The standard flywheel is adequate for competition use as supplied. The balance should, of course, be rechecked before assembly on the engine. It is possible to lighten the stock wheel to a **minimum** of 16 lbs. I do not advise going lighter than 16 lbs. for safety reasons. Care should be taken while machining the stock flywheel to insure that no section is less than 7/16" thick. When lightening the wheel, a ⅜" minimum radius should be used at all corners. A factory lightned flywheel is available for 18GB engines. Part #AHT 86. Photo #4.



(#4)

VI. **Distributor Modifications**

The vacuum advance can be removed and the mechanical advance should be reworked to be compatible with the other engine modifications. As a general rule, the MGB fully modified and tuned as this book describes, will require 28 degrees at 4000 rpm and 30 to 32 degrees at 6000 rpm with the advance stopping at 6000 rpm. This modification can be accomplished by use of special distributor springs and weight modifications on the centrifugal advance mechanism in the distributor. This is listed as Item HAE 278.

VII. **Inlet Manifold**

It is necessary to match up the ports to the cylinder head and the carburettor openings to the fiber blocks. Then blend in the opening in the manifold to give an even tapered bore, direct to the port diameter. **Do not** open up the inlet manifold beyond the carburetor outlet size which is 1½". A small increase in air flow can be achieved by grinding a small radius, approximately ¼", at the opening of the balance tube cavity. This is to be done on both the leading and trailing edges. It is a good idea to drill through the intake manifold flange and into the cylinder head face while it is in its proper position and install a ⅛" dowel to locate

the port openings. Warning — do not drill more than ¼" deep into the cylinder head. This hole should be drilled parallel to the center line of the intake manifold studs.

VIII. **Push Rods**

It is advisable to use, for competition use, the special tubular steel push rods available as part no. HAE 275. These tubular push rods come in two lengths, one standard and one special to accommodate either a re-ground cam heel diameter or a standard heel diameter. If a special length push rod is required, they can be easily shortened by using a parting tool ground to the proper width and turned in an engine lathe. The button ends need not be removed completely during this operation. These push rods are not appreciably lighter but are much more rigid and not subject to high frequency harmonics during extreme rpm.

There are two valve spring kits which are available with our competition cam shafts. See parts list appendix II. These are mandatory for use with a high lift, long duration competition camshaft. They consist of a premium valve spring with alloy collars which will assure safe high rpm operation without valve float. The valve springs must be installed in the cylinder head **exactly** to the specifications which are furnished with each valve spring kit. Failure to do this will cause undue strain on the rocker arm and push rod resulting in either fractures, bending or severe engine damage. In some cases, the cylinder head must be spot faced to allow for the increased lift without coil binding the valve spring. In other cases, a spring shim may be required to get the proper poundage and installed length.

X. **Camshaft Selection**

We have available several excellent competition camshafts. You will see on graph #1, page 38, a power curve comparison which will help in the selection of the cam you wish to run in your own engine. The comparison chart was done using exactly the same engine in all respects with exception of the camshaft. You must take into consideration the rpm range in which you expect to operate your engine. It would be foolish to select a cam which gives you maximum power at 7500 rpm and you plan only to operate your engine to a maximum of 6800. If this selection were made, the power lost at the low end, such as 4500 rpm, would be a detriment in the performance of your car and not going up to the power peak would also curtail your performance; therefore, a cam, using shorter duration, with good mid-range power output would be a better selection in your case.

XI. **Degreeing the Camshaft**

Unless you are completely familiar with all aspects of the degreeing in the camshaft, we do not suggest you try this operation at all. Simply fit the cam sprockets and chains to their standard timing marks as extreme

accuracy has gone into the machining of the aforementioned camshafts. If you do, however, feel that you wish to check your own camshaft out, all checking clearances are taken from the camshaft itself, not at the valve. We do this to be sure that the camshaft is not blamed for faulty rocker ratios, flexing push rods, loose rocker bushings, etc.

Checking specifications are available on each camshaft. They are given in thousandths of an inch of lift at top dead center on the overlap stroke only. The best way to check this is to install the camshaft, install the intake and exhaust tappet or number 1 cylinder. Use a dummy push rod and 2 dial gauges with a minimum of ½" lift. Rotate the engine until both valves are completely closed. Zero both dial indicators. Rotate one complete turn to **top dead center** on the **overlap stroke** and read both indicators. If your intake valve reads .186" and the exhaust valve .150", it is obvious that the cam is advanced; from this you may back the camshaft up slightly and then bring forward in the normal rotation until both indicators are the same. Checking your degree wheel, you will find the degrees of advance or retard necessary to split the overlap on the camshaft. This can be done by broaching a new keyway in the proper position or by using an offset key. However, in many cases, cams are designed to run in this condition. That is, in an advanced or possibly a retarded position. Checking specifications on cams are given with the individual cam.

XII. **Spark Plugs**

A competition engine, modified to the extent which we have covered in this book normally requires an N60Y Champion spark plug. This is my recommendation for competition use. However, an N63Y and an even warmer N64Y plug is available for short duration races or warmups. In nearly all cases, the N60Y plug will be adequate for warm-up, practice, and all-out competition use, without danger of fouling or burning. This extended-tip type spark plug generally gives 2 to 3 horse power over a standard racing gap plug in an MGB.

Overtightening the spark plug is a common failure with most mechanics. It is necessary only to tighten the plug so that the gasket seats properly. This can be done with one hand and a T-handle. It requires approximately 15-foot lbs. of torque. In most cases, the N60Y plug will last two to three weekends of racing unless completely fouled by improper carburettor adjustments or burned by lean mixture or too much spark lead. Use .025" plug gap.

XIII. **Ignition Wiring**

The standard high tension lead, which is supplied on the MGB is for normal usage and quiet radio operation. It is not, however, for racing use. This carbon-filled wire should be discarded and a new wiring harness made up either of the Packard 440 wire or the Lucas yellow and black stripe competition wire. We do not suggest the use of any high resistance wire for this case. Champion waterproof spark plug connectors—part number 13H1950 are recommended as they are an extremely tight fit on

the spark plug and resist falling off during the race. They also keep out moisture during operation in rainy weather. A Lucas sport coil is completely adequate for competition use although a number of American-made coils by Delco or Mallory are also an excellent choice. When installing the wires in the distributor cap, make absolutely sure that the pointed screw is inserted directly in the center of the wire so that no insulation remains between the screw and the wire core. — No radio noise supressors. —

XIV. **The Exhaust System**

For a competition exhaust system, the factory competition header part no. AHH 7103 is proven to be an excellent all-round system. Many hours of dyno development have gone into various styles and configurations, some of which were better and some of which were worse, but all of the types which resulted in increased horse power at one particular rpm lost more than the gain at some other given rpm. Therefore, I suggest the factory header as a standard to work with. This exhaust header should be complemented by the use of 1⅞" OD exhaust pipe running to the back of the car and terminating in a megaphone. The length of this system including the megaphone should be measured at the junction point of the two down pipes on the header, and should be 8 ft. 3 ins. long; exactly. I am sure you will note that there are many other configurations of the exhaust system running on MGB's throughout the country, but this particular set-up has proven best in all cases for us.

XV. **The Cooling System**

The standard MGB radiator is adequate in most areas of the United States for competition but, under certain high temperature conditions and high power outputs, this cooling capacity is borderline. I suggest the radiator tanks be retained and a new core installed fully 1" thicker than the standard core. This will still fit in the standard mountings and is legal in SCCA regulations. In having the radiator recored, also specify a high quality radiator core with the highest number of fins per inch available. A recored, heavy duty, MGB radiator, Item No. HAE 7000, is available. Be sure to check all radiator hoses thoroughly before reinstalling. It is advisable to replace these as a matter of maintenance 2 or 3 times per season. A good trick to insure that the hoses will not burst under extreme pressure conditions, is to thoroughly wrap each hose using plastic electrical tape. This also protects the hose from abrasions which might be the result of other parts rubbing against them during competition. To install a surge tank use tank part #AEA 326 and replace radiator cap with CAP #ARK 1045, CAP #GRC 104 is used on the surge tank, connect the radiator overflow to the surge tank with hi-pressure hose and hose clamps.

XVI. **Connecting Rods**

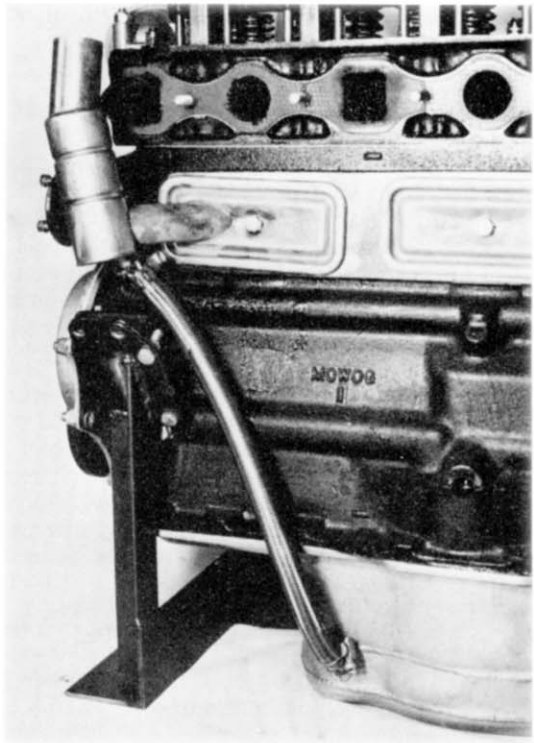
The rods should be first cleaned thoroughly and magnafluxed. Once proven clear, they should be inspected and all scratches, nicks or flaws

polished, ground or filed out. Balance next. Then shot peen or glass bead peen to remove all signs of tool marks or imperfections.

Rod bearing bore must be checked after this procedure as it may relieve stresses in the rod and cause its size to change. Resize if necessary. Check end to end length to get all within plus .002″ to minus .002″. The rods should then be side ground to give .017″ side clearance. Check the rod alignment next and you are ready to install. I advise the use of special rod bolts, Item HAE 290. Specially prepared stock rods are also listed as Item HAE 300.

XVII. **Cylinder Block Breather**

The best place to breath the MGB engine is in the front side cover over the tappet gallery. This can be done very simply by using the **tappet front cover** from the **1100 MG Midget,** part No. 12A1212. The top of this breather can be opened up and a short piece of 1½″ tubing brazed in. The bottom of the breather should be drilled and a short length of ½″ steel tubing brazed in position, angling towards the front, left corner of



the pan. A similar ½" piece of tubing should be installed below the oil level in the front left corner of the engine sump and brazed into position. Connect these two ½" tubes with an armored oil line. Clamp the line in position to make a drain for the breather. The top of the breather at the 1½" outlet can be routed to a convenient spot and connected to a 1½ to 2 quart container which is required by the SCCA Technical Committees. By building the breather in this manner, any oil which does find its way into the breather will automatically drain back into the oil pan, rather than go into the tank. I do not advise any other engine breathers, especially on the rocker cover. An equal pressure in the rocker cover and the oil sump are required for adequate drain-down of the oil during high rpm operation. See photograph #5.

XVIII. **Engine Balancing**

Of course, the entire engine should be balanced to a very close tolerance. This can only be done by a competent balancing shop and should not be put into the hands of anyone who does less than **excellent** work. Many hours of careful preparation on the engine can be ruined by an improper balance job of a careless workman during the balancing operation. All reciprocating parts should be balanced within 1/10th of a gram.

XVIX. **Clutch**

With the increase in power output, it is essential to fit a competition clutch assembly and component parts (See Appendix I for part number). It is also desirable to improve ventilation of the bell housing. This may be done by removing the drain split pin from the base of the bell housing, drilling the hole out to ⅝", and discarding the rubber bellows from the clutch operating lever. If the factory lightweight flywheel, part number AHT 86, is used it must be balanced with the clutch assembly and crankshaft. This flywheel is only suitable for use on 18 GB engines.

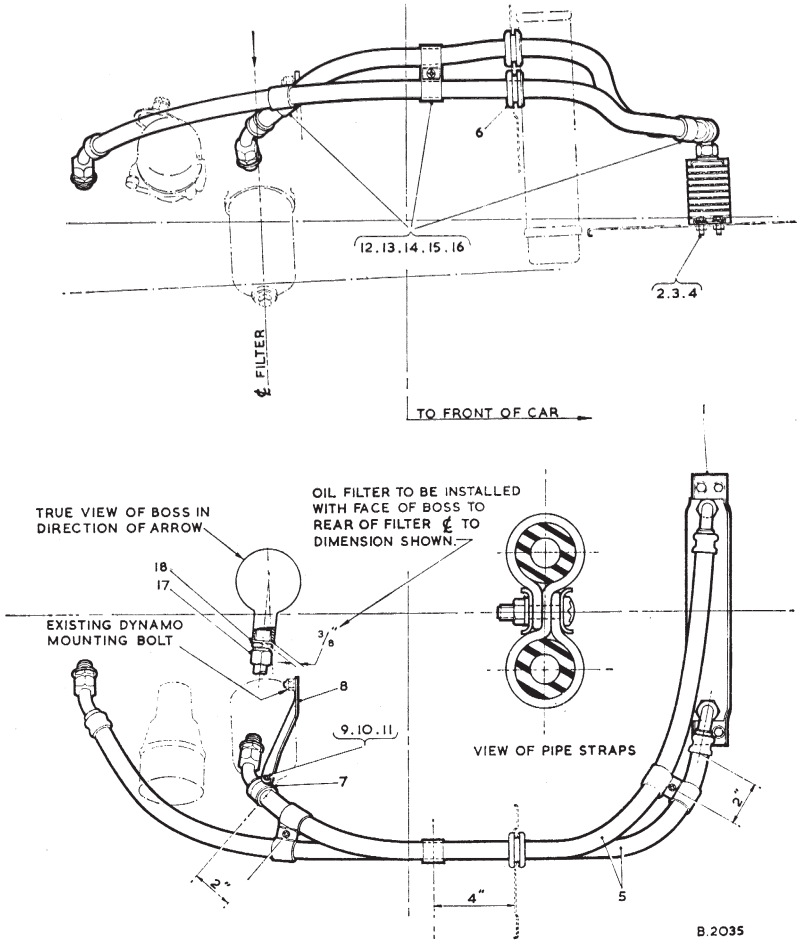
XX. **Gear Box**

Alternative close ratio gears are available for the MGB gear box as fitted to the 18G/18GA and 18GB. For vehicles fitted with all syncro boxes, i.e., 18GD/18GF, a special gear set is available. Note that the three syncro and four syncro gear boxes are **not** interchangeable.

Early 18G/18GA and 18GB gear boxes fitted with the small diameter layshaft may be modified to accept the later and stronger layshaft by boring out and line reaming the layshaft mounting holes to .6688"/.6699" and fitting layshaft part number 22H 571.

XXI. **Oil Cooler**

For maximum oil cooling use oil cooler part number ARO 9875. If your vehicle has not been previously fitted with an oil cooler, see the mechanical parts list for part numbers of pipes and clips, etc. The following drawing shows the general layout of the oil cooler installation.



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.

SECTION II

A. Setting up your MGB suspension for Road Racing.

1. FRONT SUSPENSION

One of the very first steps to consider in the competition preparation of any sports car is the complete teardown and Magnaflux inspection of all the running gear components. It is advisable to completely steam-clean the undercarriage and suspension parts prior to dissassembly and then visually inspect to make sure that none of the suspension components has been damaged in a collision or by general fatigue. The spindles and king-pins as well as the upper and lower A-arms should all be Magnafluxed, the front hubs should have the wheel studs removed and Magnafluxed individually. It is advisable to use either glass peining or steel shot peining in the radiuses on the front spindles and king-pins. This removes any minute scratches or imperfections in the finished machine work which could eventually start a fatigue crack.

2. FRONT SPRINGS

The standard front springs from the MG Tourer can be used by removing one full turn and having the spring reset. However, the ideal situation is to use the factory Competition Spring AHH-5789 or the re-worked spring listed as HAE-557. This spring gives a total drop to the front end of 1⅞" to 2". We also suggest the use of a ¾" or 13/16ths inch front anti-roll bar. The ¾ inch bars is AHH-7924; the 13/16th inch bar is HAE-500.

3. CASTER AND CAMBER

I have found through extensive testing that the MGB handles best with the following static settings: Caster should be 4½° to 5°; front camber should be ¼° to ½° negative; toe-in on most high-speed courses should be from 0" to 1/16" toe-in. For slower courses as much as 3/16" toe-in may be used to accentuate rearend oversteer.

4. COMPETITION SHOCK ABSORBERS:

The reworked competition shock is HAE-558. During competition the rubber grommets which are used in the lower A-frame and the top of the king-pin may frequently become compressed or worn. These should be checked visually by dismantling every two or three races to make sure you have good support on your lower and upper A-frames. These bushings may be replaced by Teflon Bearing Kit HAE-651. Factory competition shock absorbers and shock absorber valve assemblies are available. See Appendix I. **Do not** fit comp. valve assemblies to worn shock absorbers.

B. REAR SUSPENSION PREPARATION

1. Disassemble the entire rear suspension housing, springs, shock absorbers, shock links, etc. Check the attaching points in the frame for fatigue cracks in the chassis or imperfect welds in this area, and repair as necessary. Magnaflux the rear hubs, first removing the studs; Magnaflux

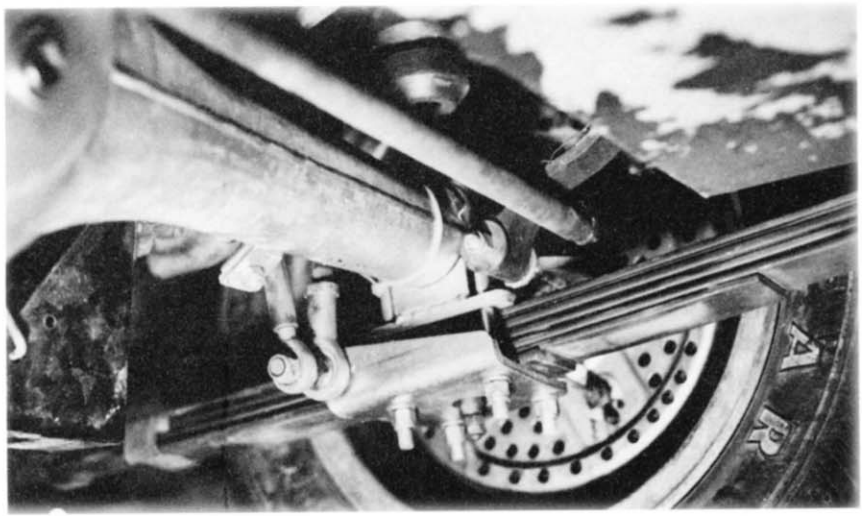
the wheel studs separately. Magnaflux the ends of the rear axle housing, and check with a micrometer to ensure that the bearing support surface is the proper size and is not out of round. Pay special attention to the threaded area on the end of the housing, as the threads may have been damaged by previous overtightening of the retaining nut. Magnaflux the rear axles, paying particular attention to the inner end which engages in the differential and in the outer radius on the flanged-type rear axle. A reworked rear hub and axle assembly which is excellent for competition use is listed in our Competition Parts List as Item HAE-575.

2. **REAR SPRINGS**

Standard rear springs for the Tourer may be used for competition by de-arching 1½" (this is best done by a competent spring shop). Alternatively the rear spring No. HAE-581 may be used. This spring affords a 1½" drop to the back of the car.

In order to use the current 6½" wide magnesium wheel and the current wide racing tires, it is necessary to use spring set and lowering block assembly HAE-585. This spring has offset eyes which allows the spring to give more clearance at the tire, yet retains its standard mounting points.

3. **Panhard: A PANHARD ROD** (Shown in photo #6) should be used to locate the rear axle when the car is used for competition. This kit is listed as HAE1601. A rear sway-bar and linkage should be used in conjunction with the 13/16ths inch front anti-roll bar mentioned in Section I. This bar gives excellent balance in relation to the front bar for high speed cornering and allows very little body roll without the use of excessively stiff springs. This is listed as HAE-615.



4. **A LIMITED SLIP DIFFERENTIAL** is a must for competitive road racing. This allows equal traction to both the rear wheels while accelerating out of a turn, and affords a much better balance to the car than by using a locked-up differential such as welding the axle spider gears. This item is HAE-675.

5. **THE STANDARD DIFFERENTIAL BREATHER** should be removed and a ⅛" pipe thread fuel line fitting installed in the housing so that a rubber vent tube may be extended from the housing up inside the trunk to a high location. This will allow proper breathing of the differential during racing conditions. It will eliminate the possibility of wheel seal leakage.

GENERAL PREPARATION OF THE CHASSIS FOR COMPETITION:

It is advisable for ease of maintenance while preparing your car to remove the insulation and floor mats from the floor and completely strip away the paint and body deadener. This can then be sealed with a very durable epoxy enamel which will allow for much easier maintenance on your car. I suggest prior to doing this painting, that a roll cage incorporating a loop underneath the dash and attached to a sturdy roll-bar, should be installed (see photo #7). It is aadvisable to strip all the paint from the engine compartment and re-coat with epoxy enamel at this time. This will resist the constant cleanings and will also resist brake fluid if spilled on the paint. A low-drag windscreen which will comply with the GCR for SCCA racing is available as HAE-650. The driver's seat should be replaced by a sturdy, well-mounted bucket seat to afford good protection as well as confort for the driver (see photo #8). A bucket seat, HAE-655, is listed in our parts catalog.

6. **BRAKE BALANCE MECHANISM**

I suggest the use of a balance bar and dual master cylinder for competitive use. This system incorporates the use of two ⅝" bore master cylinders spaced 3½" apart and attached by a cross-bar pivoted on a self-aligning Una-Ball mounted on the brake pedal. The ends of the balance rods are atached by clevis pins. The balance bar is threaded so that it may be adjusted by moving the locking units to either side, thus giving bias to either the front or the rear brakes as needed.

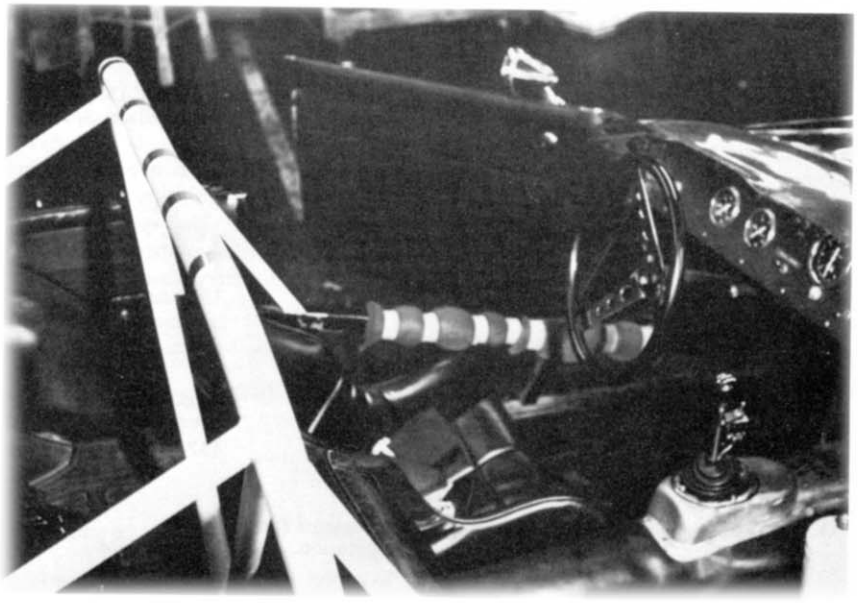


Photo #7

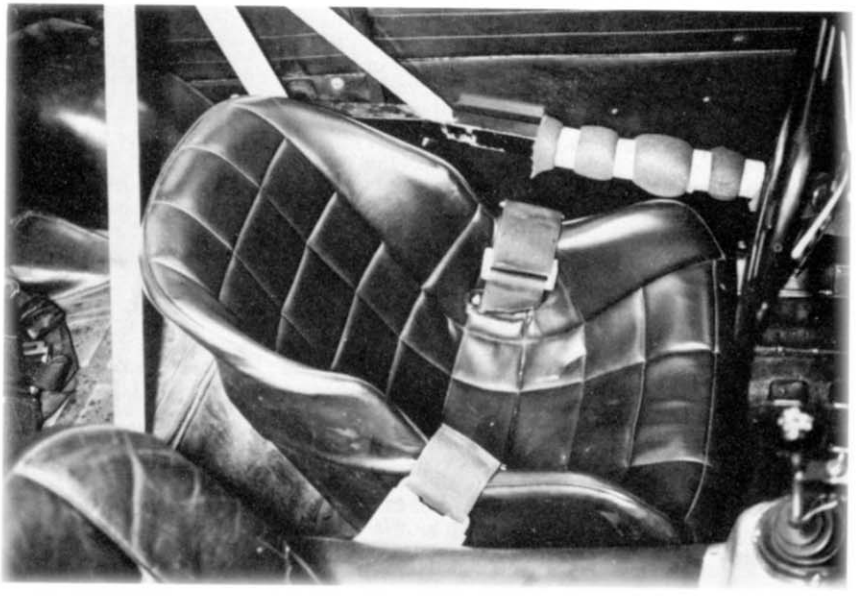


Photo #8

Section III

STOCK SPECIFICATIONS

		HUFFAKER Competition Specs.
Engine		
Type	18G/18GA (3 main bearings) 18GB (5 main bearings)	
Number of cylinders	4	
Bore	3.16 in. (80.26 mm.)	3.200″
Stroke	3.5 in. (89 mm.)	3.500″
Capacity	1798 c.c. (109.8 cu. in.)	1840 c.c.
Firing Order	1, 3, 4, 2	
Compression ratio	H.C. 8.8 : 1 (L.C. 8 : 1)	12:1 — 12.570:1
Capacity of combustion chamber (valves fitted)	42.5 to 43.5 c.c. (2.59 to 2.65 cu. in.)	40 cc. capacity of unswept area
B.H.P.	95	137 BHP approx.
Torque (lb. ft.)	110 (15.2 kg. m.) at 3000 r.p.m.	
Octane rating	Minimum requirements for knock-free operation. H.C. 98+	104+ octane
Cooling system	Thermo-siphon, pump- and fan-assisted	
Oversize bore Maximum	.040 (1,840 c.c.)	.040″—.047″ 1849c.c.
Crankshaft		
Main journal diameter	2.126 to 2.127 in. (54.01 to 54.02 mm.)	2.125—2.11255″
Minimum regrind diameter	2.086 in. (52.984 mm.)	1.8755″
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	Steel-Backed
Top half	Steel-backed copper-lead	VP lead indium
Length		
Front, centre & 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.)	.003″ to .005″
End-thrust	Taken by thrust washers at center main bearings	
Running clearance	.001 to .0027 in. (.025 to .0688 mm.)	.0025″ to .003″

Stock Specifications (cont'd)

Connecting Rods		
Type	Angular-split big-end	Use grade 8 bolt
18G/18GA	Split clamp small end	
18GB	Bush small end	
Length between centers	6.5 in. (165.1 mm.)	
Big-end bearings		
Material, top half	Steel-backed copper-lead	
Material, bottom half	Steel-backed copper-lead	VP lead indium
Bearing side-clearance	.008 to .012 in. (.203 to .305 mm.)	.015″ to .017″
Bearing diametrical clearance	.001 to .0027 in. (0.25 to .0688 mm.)	.0025″ to .0027″
Gudgeon pin bore (18GB)	.8126 to .8129 in. (19.68 to 19.95 mm.	.8130″
Pistons		
Type	Aluminum alloy	Forged alloy
Clearances		
Bottom of skirt	.0018 to .0024 in. (.045 to .060 mm.)	.0055″
Top of skirt	.0036 to .0048 in. (.091 to .121 mm.)	.0075″
Oversizes	+.010 in., +.020 in. +.030 in., +.040 in. (+.254 mm., +.508 mm., (+.762 mm., +1.016 mm.)	+.040″ to .047″ Flat top or domed
Piston Rings		
Compression: Plain	Top ring (chrome-plated)	Plain 1/16″ (1)
Tapered	Second and third rings	Stepface 1/16″ (2)
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.)	.015″—.018″
Clearance in groove	.0015 to .0035 in. (.038 to .089 mm.)	.003″
Oil control ring	Slotted scraper	
Width	.1552 to .1562 in. (3.94 to 3.99 mm.)	5 piece steel (3)
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.)	.003″
Gudgeon Pin		
18G/18GA		
Type	Clamped	
Fit (in piston)	Free fit to 20°C. (68°F.)	.0008 cl
Diameter	.75 in. (19.05 mm.)	

Stock Specifications (cont'd)

18GB		
Type	Fully floating	
(Fit (in piston)	.0001 in. to .0035 in. (.0025 to .007 mm.)	.0008″
(Fit (in bush)	Hand push	
Cylinder Head		
Cylinder head depth	3-11/64 +.015 in. −.000 in. (80.6 +.400 mm. −.000 mm.)	3.055″ Ft piston 3.145 Dome Piston
Thickness of cylinder head gasket	.023 in. (.584 mm.) compressed	.027″
Capacity of cylinder head gasket	3.208 c.c.	3.200 c.c.
Capacity of combustion space	42.5/43.5 c.c. (valves fitted)	36.4 c.c.
Capacity of piston head below block face	H.C. 10.87 c.c. (L.C. 17.43 c.c.)	0 to .5 c.c.
including capacity of piston concavity	H.C. 6.25 c.c. (L.C. 12.8 c.c.)	
Capacity of plug center hole	.2 c.c.	
Inlet and exhaust manifold gasket	Part No. 1G 2417	
Valve seat angle in cylinder head	45°	45°
Valves and Valve Gear		
Seat angle Inlet and exhaust	45°	45°
Head diameter Inlet	1.562 to 1.567 in. (38.67 to 38.8 mm.)	1.567″
Exhaust	1.343 to 1.348 in. (34.11 to 34.23mm.)	1.347″
Stem diameter Inlet	.3422 to .3427 in. (8.692 to 8.709 mm.)	Same
Exhaust	.34175 to .34225 in. (8.680 to 8.693 mm.)	Same
Throat diameter		
Inlet	1.3125 in. (33.33 mm.)	1.4125″
Exhaust	1.156 in. (29.36 mm.)	1.200″
Valve stem to guide clearance		
Inlet	.00155 to .00255 in. (.0394 to .0648 mm.)	.002 to .0025″
Exhaust	.00200 to .00300 in. (.051 to .076 mm.)	.002 to .0025″

Stock Specifications (cont'd)

Timing markings	Dimples on timing wheels	
Chain pitch and number of pitches	3/8 in. (9.52 mm.), 52 pitches	
Valve Guides		
Length		
Inlet	1-5/8 in. (41.275 mm.)	1.625" Bronze
Exhaust	2-13/64 in. (56.96 mm.)	1.625" Bronze
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.)	.625 with Teflon stem seals
Valve Springs (stock)		
Free length		
Inner	1-31/32 in. (50 mm.)	
Outer	2-9/64 in. (54.372 mm.)	
Fitted length		
Inner	1-7/16 in. (36.51 mm.)	
Outer	1-9/16 in. (39.69 mm.)	
Number of working coils		
Inner	6½	
Outer	4½	
Pressure		
Valve open	Inner 50 lb. (22.7 kg.) Outer 117 lb. (53.08 kg.)	Total 260-270 with valve open
Valve closed	Inner 30 lb. (13.6 kg.) Outer 72½ lb. (32.89 kg.)	
Tappets		
Type	Flat base. Barrel type	Same
Diameter		
Body	13/16 in. (20.64 mm.)	
Working face	9/16 in. (14.29 mm.)	Re-Radiused stock tappe
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	1.426:1

Stock Specifications (cont'd)

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.)	.003″ + .001″ — .000″
Bearings—number & 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	Stock pump re-worked (see text)
Relief pressure valve operates	70 lb./sq.in. (4.9 kg./cm.²)	Same
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	Same
Identification colour	Red spot	Same
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)	70 lbs./sq.in.
Torque Wrench Settings		
Cylinder head nuts	45-50 lb.ft. (6.2-6.9 kg.m.)	50 lbs. ft.
Main bearing nuts	70 lb.ft. (9.7 kg.m.)	70 lbs. ft.

Stock Specifications (cont'd)

Connecting rod set screws	40-45 lb.ft. (5.5-6.2 kg.m.)	45 lbs. ft. Special screws
Clutch assembly to flywheel	25-30 lb.ft. (3.45-4.1 kg.m.)	25 lbs. ft.
Flywheel bolts	40 lb.ft. (5.5 kg.m.)	45 lbs. ft.
Gudgeon pin set screws	25 lb.ft. (3.45 kg.m.)	25 lbs. ft.
Fuel System		
Carburetor		
Make and type	S.U. twin HS4 semi-downdraught	
Diameter	1½ in. (38.1 mm.)	1.600" inlet
Carburetor piston	Part No. AUC 2061	Re-worked
Air Cleaner		
Make and type		
Cooling System		
Type	Pressurized radiator, thermo-siphon, pump- and fan-assisted	Use 13 lbs. cap and surge tank
Filler cap spring pressure	7 lb. (3.175 kg.) or 13 lb.	13 lbs. with surge tank
Ignition System		
Spark plugs	Champion N-9Y	N60Y
Size	14 mm.	
Plug gap	.024 to .026 in. (.61 to .66 mm.)	.025"
Coil	Lucas	Lucas sport coil
Distributor	Lucas, Type 25D4	Re-worked adv curve (see text)
Distributor contact point gap	.014 to .016 in. (.35 to .40 mm.)	58° to 60° dwell
Clutch		
Make and type	Borg & Beck 8 in. (20.3 cm.) diaphragm spring. Strap drive	8" HD cover
Diameter	Borglite	8" bondedcomp disc
Damper springs	6	
Gearbox (Standard & Overdrive) 18G/18GA/8GB		
Number of forward speeds	4	
Synchromesh	Second, third & 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	

Stock Specifications (cont'd)

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 ratio —	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 (close-ratio) (Non-overdrive and Overdrive)

Number of forward speeds	4	
Synchromesh	Second, third & fourth gears	
Overdrive ratio	.802	
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

Stock Specifications (cont'd)

Speedometer gears ratio	9 : 28 (overdrive 5 : 16)	
Optional axle ratios	Overall ratio —	M.p.h. per 1,000 r.p.m.
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

APPENDIX I

The following parts are manufactured by British Leyland Motor Corporation, Special Tuning Department, and may be ordered through any authorized Austin/MG Dealer in the U.S.A.

Description	Part No.	Qty./Car
CAMSHAFT & DISTRIBUTOR		
Half race 24°, 64°, 59°, 29°, Lift 0.25″	AEH 714	1
Full race 50°, 80°, 75°, 45°, Lift 0.315″	AEH 770	1
Sprint 60°, 80°, 75°, 45°, Lift 0.315″	AEH 863	1
Super-sprint 60°, 80°, 85°, 55°, Lift 0.315″	AEH 862	1
Distributor (for full race camshaft)	BHA 4415	1
CYLINDER HEAD & VALVE GEAR		
Valve guide — inlet (Hidural)	AEH 755	4
" " — exhaust (Hidural)	AEH 756	4
Inlet valve 1.56″ dia. (Nimonic)	AEH 757	4
Exhaust valve 1.34″ dia. (Nimonic)	AEH 758	4
Valve spring — Inner 57 lb.	IH 1112	8
" " — Outer 140 lb.	AHH 7264	8
" " — Inner 60 lb.	AHH 7265	8
Valve spring top cup (For nimonic valve and	AEH 760	8
" " bottom cup for double springs)	AEH 801	8
Valve collets — pairs (for nimonic valves)	AEH 761	8
Valve springs — triple (Set of 3)	AHH 7309	8
Valve spring top cup (for triple springs)	AHH 7313	8
Valve rocker — strengthened	12H 2037	8
Rocker shaft bracket — front	AEH 762	1
Rocker shaft bracket — rear	AEH 763	1
Distance piece for rocker — long	AEH 764	1
Distance piece for rocker — short	AEH 765	2
Tappet adjusting screw (undrilled)	AEH 766	8
Push rod — short	AEH 767	8
PISTONS, CONNECTING RODS & GASKETS		
High competition pistons (18G/18GA only) +0.040″		
(use with connecting rod set AJJ 3357 only)	AEH 073643	4
Piston ring — top	AEH 738	4
Piston ring — second — third	AEH 854	8
Piston ring — scraper	12H 759	4
Cylinder head gasket — competition	AEH 768	1
CRANKSHAFT & BEARINGS		
Connecting rod bearings (18GB only)	18G 8022	1
Connecting rod bearings (18G/18GA only)	8G 2259	1
Crankshaft chain wheel (Steel)	12H 244	1

Description	Part No.	Qty./Car
OIL SUMP & COOLER		
Deep type sump (18G & 18GA only)	AHH 7252	1
Deep type sump (18GB only)	AEH 832	1
Packing piece for strainer (18G & 18GA only)	AHH 7238	1
Packing piece for strainer (18GB only)	AEH 847	1
Competition large capacity oil cooler	ARO 9875	1
Packing oil relief valve spring (Std. on 18GB)	AEH 798	1
ENGINE ANCILLARIES		
Pulley for dynamo (reduced speed)	2A 864	1
Fan belt (for reduced speed pulley)	13H 923	1
Blanking sleeve thermostat by-pass	11G 176	1
CLUTCH & FLYWHEEL		
Competition cover assembly	BHA 4642	1
Competition driven plate	BHA 4519	1
Thrust bearing assembly	27H 2609	1
Thrust bearing retaining spring	22B 66	2
Lightened flywheel (for 18GB engines only)	AHT 86	1
GEARBOX		
Close ratio gears — 1st Motion Shaft 18G & 18GA	22H 472	1
1st Motion Shaft 18GB	22H 846	1
2nd Speed Gear (was 1H 3299)	22H 1094	1
3rd Speed Gear	1H 3300	1
Laygear — small diameter	1H 3298	1
Laygear — large diameter	22H 932	1
Close ratio gear set for 18GD (all synchro box)	AJJ 4034	1
CROWN WHEELS & PINIONS		
(Early Tourer only)		
4.3 ratio 10/43	88G 283	1
4.55 ratio 9/41	88G 284	1
(Tubed Axle only)		
3.07 14/43*	BTB 900	1
3.307 13/43*	BTB 841	1
3.909 11/43*	BTB 856	1
4.22 9/38	BTB 975	1
4.55 9/41	BTB 966	1
*These ratios require new differential cage BTB 840		
SUSPENSION		
Shock absorber comp. setting — front	AHH 7104	2
Shock absorber comp. setting — rear R.H.	AHH 7105	1
Shock absorber comp. setting — rear L.H.	AHH 7106	1
Shock absorber valve assy. — front	AHH 7217	2
Shock absorber valve assy. — rear	AHH 7218	2

Description	Part No.	Qty./Car
Anti-roll bar 9/16" (Std. on late Tourers)	AHH 7329	1
Anti-roll bar ¾" (Includes bearing & locators)	AHH 7924	1
Installation kit (See Booklet for use)	AJJ 3306	1
Front coil spring rate 348 lb./in. (Std. on Tourer)	AHH 6451	2
" " " rate 480 lb./in. (Std. on GT)	AHH 5789	2
" " " rate 480 lb./in. (Lowered)	AHT 21	2
Rear leaf spring rate 93 lb./in. (Std. on late Tourer)	AHH 7080	2
" " " rate 99 lb./in. (Std. on early Tourer)	AHH 6455	2
" " " rate 100 lb./in.	AHH 8343	2
" " " rate 99 lb./in. (Std. on GT)	AHC 31	2
" " " rate 124 lb./in.	AHH 7346	2
" " " rate 124 lb./in. (Lowered AHH 7346)	AHT 20	2
BRAKES		
DS11 Brake pad set	8G 8834	1
VG95/1 Rear brake shoe and lining assembly	8G 8828	1
VG95/1 Rear brake lining with rivets	8G 8829	2
Rear wheel brake cylinder assy. ⅝" dia.	17H 8773	2
Pawl (for fly-off hand brake)	AHH 7223	1
Rod (for fly-off hand brake) Early cars	AHH 7222	1
Later cars	AHC 551	1
Brake servo kit	8G 8732	1
BODYWORK		
Bonnet securing strap set	AJJ 3381	1
LITERATURE		
Work Shop Manual	AKD 3259	1
Parts list — mechanical	AKD 3547	1
Parts list — body	AKD 3548	1
Factory Tuning Book (not for SCCA racing)	AKD 4034F	1

APPENDIX II

The parts listed below are manufactured by Huffaker Engineering and should be ordered directly from Huffaker Engineering, 22 Mark Drive, San Rafael, California 94903. DO NOT ORDER THESE PARTS THROUGH YOUR LOCAL AUSTIN/MG DEALER.

No.	Item
HAE 225	Flat Top Racing Pistons, +040, +047
HAE 226	Dome Top Racing Pistons, +040, +047
HAE 227	Flat Top Forged Pistons, +040, +047
HAE 228	Dome Top Forged Pistons, +040, +047
HAE 229	Rings for Forged & Racing Pistons, +040
HAE 230	Taper Bored Comp. Pins (18125 only)
HAE 240	Camshaft 288° Auto Cross 7208-9
HAE 241	Camshaft 312° Full Race 7808
HAE 242	Camshaft 316° Super Race 7906
HAE 244	Billett Cam 316° High Lift 7906
HAE 247	Lightened Reradiused Tappets
HAE 250	(Super Duty replacement Gear) (Set — Dist. Drive & Oil Pump Drive Gear)
HAE 255	Tube Push Rods, Std. Length
HAE 256S	Tube Push Rods (to order) special length
HAE 260	H.D. Springs for 7208-7808 Cams
HAE 261	Alloy Collars for (260) Springs
HAE 265	Spcl. High Tensile Springs for 7906 Cam & Collar Set
HAE 269	Alloy Flywheel
HAE 270	Huffaker Modified Carbs. 1½" SU with Special Rams
HAE 271	Ram Tubes, Pr.
HAE 275	Prepaired Cyl. Head complete, Pano
HAE 278	Competition Dis. (Recalibrated Adv. Curve)
HAE 280	Lightened Flywheel 18GA Eng.
HAE 281	Lightened Flywheel 18GB Eng.
HAE 285	Reworked Nitrited Crank (Legal)
HAE 286	Bearings — Rod
HAE 287	Bearings — Main
HAE 289	Stern Seals (Teflon)
HAE 290	Special Rod Bolts (Stock Rods)
HAE 295	Special Rod Ball (HAE Rods)
HAE 300	Reworked Rods and Bolts (18GB)
HAE 301	Reworked Rods and Bolts (18GA)
HAE 500	Front Anti Roll Bar, 13/16"
HAE 501	Rear Anti Roll Bar, 13/16"
HAE 550	Anti Sway Bar
HAE 556	Comp. Rear Springs (2" drop)
HAE 557	Front Springs, Racing
HAE 558	Front Springs (reworked)
HAE 561	Teflon Bushing Kit

No.	Item
HAE 575	Comp. Rear Auxiliary
HAE 581	Comp. Rear Springs
HAE 585	Spring Kit Lowering Block and Offset Eyes
HAE 601	Panhard Bar Kit
HAE 615	Anti Roll Bar Kit, Rear
HAE 650	Wind Screen (Racing)
HAE 655	Bucket Seat, Upholstered
HAE 660	Competition Wheel (Steering)
HAE 675	Limited Slip Differential