Chapter 1
Planning an upgrade/ conversion

PLAN CONSERVATIVELY

When I wrote the first edition of this book some 10 years ago there were already many ways to improve your MGB, C or V8. This edition is also written from the standpoint that you have an MGB, C or V8 and would like to improve its performance in one, or perhaps a number of ways. Consequently, I have given over no space to originality issues. The range of products and opportunities has grown in the intervening years, probably making the MGB/C/V8 range the most post-production-developed cars in use today. Thus the options have multiplied several fold, but so have the costs and the difficulty of selection.

The original MGB/C/V8 models were basic cars employing simple technology. The increased choices of today sound great (and absolutely no-one is complaining!), but the greater variety brings with it the need to choose wisely, particularly from the value-for-money, budgeting and compatibility points of view. Selection is sometimes made no easier by the fact that the complexity of some products (and the technology employed) is out of the experience of many enthusiasts, and puts greater emphasis on the fine-tuning and detailed adjustment of the car than ever before. So, if you understand the basics of electronics or boost pressures, or the consequences of pre-ignition, then advances in technology should present few problems. If you don't, as may be the case with some readers, this book will help you select wisely.

If you find you're getting out of your depth with any of these technologies then you should stick with what you understand and feel comfortable with. Once the complexities start to get beyond you, opt for one of several conservative approaches. For example, buy your upgrades in kit form. The trade recognises that not every owner will be familiar with the technology involved in some upgrades, and helps owners by assembling pre-tested kits, which usually include comprehensive fitting, assembly and testing instructions. Ask to see those instructions and enquire about after-sales technical advice.

If you're still unsure, find a specialist within the MG trade with experience of fitting the relevant kit(s). Ask for a quotation, ask about the warranty period and coverage, and assign the fitting task to them. These approaches will unquestionably cost more, but the resultant upgrade should work well, and carry the reassurance of a warranty.

Another prudent/conservative approach is to buy all your upgrade parts for each project from one supplier and at the same time. That's not to say you should buy from the first supplier you approach, however; shop around.

Don't feel obliged to carry out all the changes you would like to make to the car in one session. There's nothing wrong with planning your upgrade over several phases spanning, perhaps, several years.

It really is worthwhile spending time planning your upgrade or conversion.

3-4 The MGC exhaust manifold/header. It is preferable but not mandatory to fit a twin–pipe/twin-box exhaust system at the first opportunity ... although, to be fair, you will not loose much power and will be hard pushed to detect the difference if you retain your standard single-pipe/box system, at least until it comes time to replace the exhaust system.

3-5 An MGC vernier timing sprocket bolts to the camshaft, of course, which reminds me to mention that new camshaft blanks are not now being produced. As a result, you'll need a good, straight camshaft to trade-in if/when you seek an uprated one.

out of all recognition since the MGC was designed, so the timing must be correspondingly amended – as best as a system controlled by weights and vacuum can be.

These modifications, like all that follow, must only be contemplated if the bottom of the engine is in good order, but should increase power by about 25 per cent over the standard/original engine.

UPGRADING THE CAMSHAFT

A modified-profile camshaft is the next step in tuning this willing engine. Contrary to how you would change the camshaft in most classic engines, you must be prepared to remove the engine from the car, so it's prudent to carry out this change simultaneously with lightening the flywheel. The cam should be changed with the engine out of the car because the sump needs to be dropped before the timing cover can be removed from the engine.

The standard cam provided 0.254in lift and a duration of 252 degrees. The choice of aftermarket camshafts is enormous, and a full analysis is beyond the space available here, but the cam is a key tuning and running component and it's very easy to get the choice wrong. A mild 'fast road' cam is the very least you should employ, and Piper's HR270 or Kent's AH2 will increase power and breathing giving about 270 degrees duration. I'd recommend you buy through an MGC specialist like MG Motorsport because, provided you've completed all the earlier improvements and are seeking about a 40/45 per cent increase on MGC standard output, your car may be able to handle something slightly hotter (standard lift with 280 degrees duration, for example).

It is possible to fit a 285/290 degree duration cam with a slight increase in lift at this stage, but hotter cams are normally only considered by the professional tuners at the final tuning increment, which we'll get to in a moment. Piper's HR285 will make a noticeable difference in performance from the standard cam without seriously affecting driveability in traffic, but necessitates you also address the carburation.

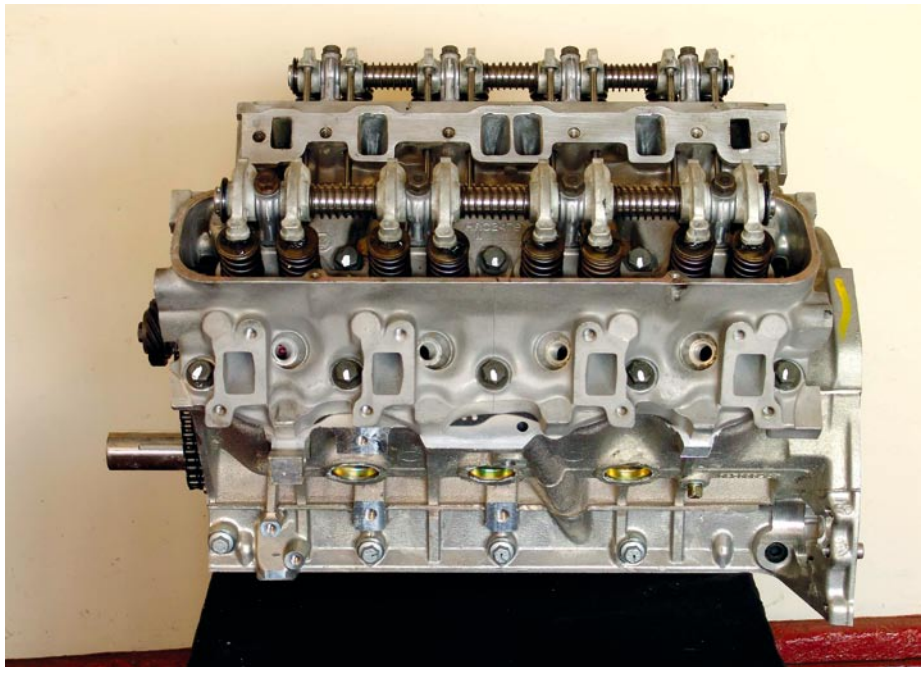
Whatever the level of improved cam you're considering, you should automatically include a vernier timing gear with the upgrade in order to time it optimally (photo 3-5). The collective improvement in power at this point will be in the order of 45 per cent.

BALANCING

The acceleration, power and top rpm potential of your engine will already be well above anything that BMC expected from a road going MGC, and even above what the original MGB V8s were providing. However, if you're thinking of going a step further, then it's necessary to dynamically balance the crank, front pulley, flywheel, and clutch. Needless to say, all this needs to be carried out simultaneously with the other 'engine-out-of-the-car' modifications.

The dynamic balancing of rods/pistons is straightforward, and is done incrementally – i.e. balance the crank, then fit the front pulley and balance that assembly, then fit the flywheel and balance that assembly. Finally, the balancer should fit the clutch and balance the whole rotating bottom end.

If you like tinkering with engines and anticipate nothing more that an interesting road going car, there's nothing to stop you polishing, shot peening, lightening and, of course, balancing the



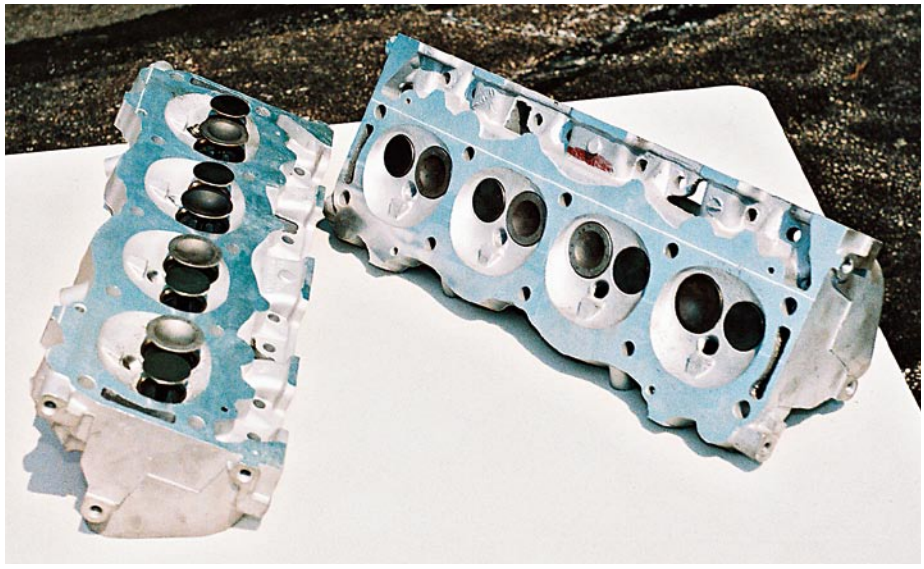
4-2-3 The 4600cc cylinder blocks have five pairs of cross bolts that go through the blocks into the sides of the main bearing caps.

sister, the 4600 unit has the advantage of a more stiffly cast block which, in the case of the 4600cc version, is further stiffened by five cross-bolted main bearing caps. The engine offers innumerable tuning opportunities, which we'll briefly explore later in this chapter, but in standard/stock tune this engine can be the heart of a very fast car indeed.

Upgrading these engines is, like the 3528 units discussed earlier, mainly focused upon the cylinder heads. The enlarged bores of these bigger engines brings the opportunity to maximize your cylinder/valve effectiveness by fitting the pair of Buick 300 heads seen at picture 4-2-4. Even the latest Rover cylinder heads with their 1.57in inlet and 1.18in exhaust valves are really only suitable for engines up to 3500cc. If you were to increase the size of the valves and fit the modified head to a 3.5in bore (i.e. a 3500cc/215ci) engine, you will find that the cylinder wall shrouds both valves. With the bigger bore (3.7in) of the larger blocks you open the possibility of bigger cylinder head valves, and these are available via the Buick 300 heads.

These heads are aluminium, and were originally fitted to the 1964 Buick 300ci engine. They are, therefore, of some age and, consequently, need to be purchased with care, but they are in many ways ideal, weighing only 18.5lb each (complete with valves, springs and retainers). They were fitted with better, although still restrictive, valves at 1.625 intake and 1.313in exhaust. Thus the standard/stock 300 heads will not flow sufficient mixture to keep up with the demands of the 4.6-litre, but would probably be acceptable for a 4.0-litre engine. They can, however, be fitted

4-2-4 Buick 300 cylinder heads are only applicable if you're fitting a 3.7in bore 4.0/4.6-litre engine, but even in standard/stock trim do improve the flow capacity of the engine.



4-2-5 This is the ultimate Wildcat head. The valves, particularly the inlets, are noticeably bigger.

Chapter 7
The rear suspension, axle & prop/driveshaft

From an overall suspension and road holding improvement point of view, one would normally look first to the front suspension of most 40-year-old car designs. However, if the original front and rear suspension arrangements on the MGB/C/V8 are in first class order, it's the rear suspension on these cars that will be the least effective. Certainly, the front end can be improved upon, and we'll look at those details in the next chapter, but it's the improvements to the original rear suspension that should be prioritised. The rear suspension problems stem from the fact that the springs perform a dual role. First off we'll look at a few tweaks to the current design, which do help, but, in truth, only changes that separate the axle-locating task from the springing function, both currently carried out by the rear leaf springs, will have the dramatic results required by many enthusiasts. These are explored later in the chapter. Only then will I move on to rear axle upgrades, ratios and propshafts.

TWEAKING THE CURRENT DESIGN

Telescopic rear dampers

If you're staying with leaf springs of one type or another, the road holding and ride improvement effected by telescopic rear shock absorbers is an essential upgrade. There are various makes of damper on the market (Bilstein, Spax, Koni and Gaz all spring to mind) but they all have one thing in common; they are telescopic in operation and replace the original 'lever arm' Armstrong units and their connecting link seen at 7-1-1-1. One detail to pay attention to when ordering is the length of the telescopic stroke you need for your car.

When you've fitted your telescopic damper kit, an example can be seen

7-1-1-1 The original Armstrong lever arm damper, its connecting link, and spring pad – all of which are discarded when replaced by the much more effective telescopic dampers.

RIM WIDTHS

The width of the wheel rim must be most improvers' next consideration. This feature is always measured in inches but often expressed as 'J' – in other words, a 6in wide rim will be shown as 6J. While engine capacity and available power must be influencing factors on the choice of rim width, the main criteria is that it **must** be compatible with the tyre that will be fitted to it. If in any doubt, seek professional advice, for not only will the effectiveness of your tyres be compromised by fitting them to an incompatible rim, but so will your safety and that of other road users.

In general terms, as stated above, the trend is towards increased tyre widths using lower profiles; thus, there has to be a parallel move towards increasing rim widths. We will look at wire wheels later in this chapter, but today's alloy wheel industry offers a huge selection of rim widths, with the added bonus of reduced weight, which improves roadholding. It is almost certain that the majority of readers preparing higher performance cars will buy at least four alloy wheels to their ideal specification. However, some readers may appreciate a few words about cheaper ways to increase wheel size and/or rim width. MGB steel Rostyle wheels offer a 5in (5J) rim width – but this can be increased at modest cost by selecting ex-Triumph TR6 steel wheels. These are 15in (which may be your preference in any event), and offer 5½J rims, or, in later examples, 6J rims, seen at 10-3. These respectively will take 195 section tyres and the later TR wheels 205s. Used TR6 wheels are available from all Triumph specialists. Another alternative, particularly in the USA, are ex-Datsun 240Z steel wheels (photograph 10-4) which retain the 14in diameter but offer a very desirable 6J rim width.

Alloy wheels are available in a huge variety of sizes, rim widths and patterns. Of these the evergreen Minilite (photograph 10-5) is probably the most popular and offers excellent capacity for brake size increases. There are a great many alternatives from numerous aftermarket sources too numerous to mention, but you'll get some idea of the range and options available from the pictures included in this chapter.

10-3 A TR6 wheel. This is an example of the later, wider 6J rim. The 195 x 65 x 15in tyre sits very comfortably.

ROAD WHEEL OFFSETS

You cannot just assume that your selected wheel size will automatically

10-4 This is Kurt Schley's lovely 1974 MGB V8 Roadster – included here to demonstrate the aesthetic and practical suitability of Datsun 240Z 14in x 6J alloys.

10-5 These are the more usual bolt-on Minilite wheels but this time finished in 'Slate.' The polished rims require some additional maintenance in that without care their surface will corrode.

10-6 The brake caliper clearance offered by these superb Compomotive wheels is exemplary. The rims are 7in and are running 205 x 50 x 16in tyres, while also showing off the brake calipers (in this case SD1 Vitesse).