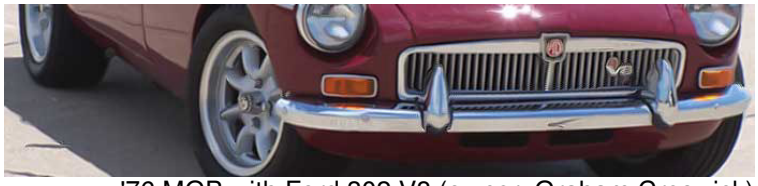

'76 MGB with Ford 302 V8 (owner: Graham Creswick)

The British V8 Newsletter - Current Issue - Table of Contents

Prefer to DOWNLOAD or PRINT the newsletter?

The editorial section of this issue is available as a printer-optimized 3.8MB PDF file. Download the PDF

What's YOUR story?

We're working on the next issue right now. Please consider submitting info, photos, or an article!


the editor's car

In The Driver's Seat (Volume XIV Issue 3, December 2006)

by: Curtis Jacobson

Welcome readers! Welcome car enthusiasts, tinkerers, inventors, hot-rodders, "tuners", and even British Car "purists"! Whether you're an old-timer around here, or new to our newsletter and our branch of the "old car" hobby, I'm hopeful and confident you'll find both entertainment and useful information in this publication.

This new issue breaks more ground for us. It contains our first articles about Sunbeam automobiles (a V6-converted Alpine and two highly modified Tigers!) and our first two MGC-V8 engine conversion articles. Moreover, it contains more of just about everything else we're known for: more articles related to engine conversions and other performance modifications, more photos, more volunteer writers, more sponsors, and more of our popular "How It Was Done" articles. I think we've got something for everyone in here.

I'm especially proud of this issue for another reason. I think more than ever before it's clear in this issue that we're providing information on performance modifications that also make classic British sports cars both safer and more environmentally friendly than they ever were before. I'll bet our average highway fuel economy is already about 25mpg. (My MGB-GT V8 got 26.5mpg coming home from our meet in Tennessee - but that's nothing compared to Brent Lancaster who reports he's averaging 31mpg on all roads!) Surely our "fleet average" is improving and will continue to improve as more and more of us learn about ignition tuning, electronic ignition, and especially electronic fuel injection. When our cars were built smog controls were a hindrance, but now we can have superior performance and be more responsible too.

The British V8 newsletter and website are a volunteer effort, and they represent the work of many hands. I want to take a moment to recognize and thank all the folks who've contributed articles and photos. Just here in the newsletter you'll probably recognize some familiar contributing writers, including Martyn Harvey, Greg Myer, Jean Montford, and Larry Shimp. I also want to thank our brand new writers: Howard Fitzcharles, Jeff Schlemmer, Kelly Stevenson, and Rob Wiseman, plus all the folks who've contributed "How It Was Done" write-ups on their cars.

Judging by the tracking statistics our web hosting company provides, the last issue of the newsletter was a very big hit! As of December 31st, the PDF version of the May-August issue has been downloaded in its entirety 1688 times. Of course, the individual articles were available online too. The most popular (non HIWD) article was the one that covered Pete Mantell's tech session on installation of Ford V8 engines in MGB's, with 1534 different readers so far. No matter how you slice it, that's a LOT more readers than we ever had as a printed newsletter.

As we digitize back issues and put them online, the website continues to grow rapidly. The website already features over 300 articles and well over 2300 color photos. I want to pause here to recognize the help of Greg Fast who has been scanning articles and running them through optical character recognition software - that's been a big help, and it will continue to be as we continue forward.

Since the last issue, I've been amazed by the generosity of readers. Since August, independent financial contributors have included Tony Bates, Greg Fast, Jay Smith, Brian Yeates, Michael Willis, and my dear friend Al Wulf. You guys are wonderful!

Finally, I want to assure everyone that the next issues of The British V8 Newsletter will be even bigger and better than this one. How can I keep promising that? I know people JUST LIKE YOU have valuable ideas to contribute, and I know you're a generous bunch of people. This is rolling and picking up speed. Don't miss out on the fun. Send in your ideas, articles, and photos now!

Very best regards,
Curtis Jacobson

p.s. Although the newsletter if FREE, financial contributions are gratefully accepted. Click here to make a contribution.

IMPORTANT NOTICE:
Got a new calendar for 2007? Please mark August 1-4, 2007 and start making plans to attend next year's British V8 meet. Kurt Schley is planning REALLY big fun. The host hotel will be the Days Inn in Willoughby Ohio. (We have a 75-room block reserved!) Kurt has also arranged our exclusive use of Nelson Ledges race track on August 2, and Pete Mantell of Mantell Motorsport will be underwriting the track-time so we can all play for just $75-per-car! An autocross is also being planned. There will be a plethora of diverse social activities, including vineyard tours and spirited country drives. (British V8 meets are great fun for couples.) Of course there will be valuable tech-sessions too!

Please don't forget to support our advertisers - and to thank them for supporting this FREE newsletter!

We welcome sponsors that are new with this issue:

Advanced Distributors, LLC	distributor rebuilding and re-curving for all vehicles.
Brit-Tek Ltd.	the MGB specialists where people are more important than parts.
Brooklands Car Components	custom V8 sports cars with a British heritage.
morSpeed Performance Products	distinctive fiberglass body products for MGB, Midget, TR7, & TR8.
Pieces of Eight!	struts to hold open the bonnet and the boot lid or GT hatch of your MGB.
Roadtronics Automotive Technologies Co.	(aka: "RATCO") Triumph frames & performance chassis upgrades.

And familiar companies that have renewed and increased their sponsorship:

Classic Conversions Engineering	MGB V6 specialists, including kits, plus MGB chassis upgrades.
Mantell Motorsport	Ford V8 engine conversions for MGB, plus powder coating.

(Are you in the British sports car performance trade? If so, you should be advertising here too!)

2006 Brooklands V8 Coupe

Canadian Corner (Volume XIV Issue 3, December 2006)

Driving the Brooklands V8 Coupe

by: Martyn Harvey

I can hardly believe I was driving an MGB V8 today! There's good reason for this disbelief. It's January in Canada. I suppose the global warming situation means the Canadians of Southern Ontario will be driving their beloved summer toys all year round. Earlier today Barry Preston was my passenger, and we were driving his shiny red Brooklands V8 coupe.

I first met Barry back in the mid-80s at a dinner party. Parked outside our host's house was a very smart looking sports car that I didn't recognize. I knew it was of British origin and I quickly recognized the classic MGB GT lines. But this car looked more Aston Martin-like, more modern, more up scale and sporty than the stock BGT. The colour was magnificent. It was a classy gun-metal silver that left me weak kneed and drooling. The car was a Brooklands Coupe and belonged to Barry. He was the designer, the builder and the owner. I wished it belonged to me, especially when I heard that it was equipped with a Ford 3-litre V6 motor. Barry is still in business today designing and building Brooklands for discerning customers who want a modern sports car with the classic British feel.

I'll always remember January 2nd, 2007 as one of those rare winter days that felt like spring had returned early. The sun was shining and the temperature was at least 50 degrees (F). The day was perfect for a spin in a Brooklands Coupe. Barry offered me the keys and I fired up the engine. The sound of the Rover V8 was delightful, especially as we pulled out on the street and gave her some gas. The engine was smooth with a nice amount of torque and the gearbox was slick. The brakes felt good and firm. Steering was nicely responsive. The ride was hard but the adjustable coil-overs could be tuned to the driver's needs and body roll was non-existent. I was thinking all these things as I adjusted myself to the car. It felt good and we had only driven a few yards up the road! Gotta love that!

The Rover V8 powered "Brooklands GT"

Brooklands Cars has been featured in several magazine articles over the past few years. It's not surprising that the concept of modernizing the venerable MGB would attract attention, especially when it is done as well as the Brooklands. I'm sure many of us MGB conversion enthusiasts can relate to Barry's passion. Here's a quote from the April 1991 edition of British Car magazine:

"Barry Preston, like many a car enthusiast, spent his spare time thinking about the joys of motoring and, in particular, of the joys of driving his ideal dream car. Where Barry differs from the majority of car enthusiasts is in the fact that he has turned his dreams into reality by manufacturing the Brooklands series of roadsters based upon the MGB body and chassis... the Rover-powered Brooklands features body styling with headlights blended into the fender lines... Mustang II front suspension... the Brooklands is undeniably a stylish looking car... in the spirit of the great British sports cars..."

And about ten years ago, MG World magazine wrote:

"...the body panel finish and fit is excellent; it really does look like a production car. The doors, glass and roof are all pure MG, but that's where the similarity ends. Looking through the windscreen, you realize that the body is five inches wider and the front wings are lower and flatter. On the road, the Ford-based suspension gives a smoother and more refined ride. And, of course, the V8 engine puts the performance in a different league altogether from the standard 1800cc 'B'. The Brooklands Renaissance is by no means a hi-tech car - it doesn't pretend to be - but it does win you over with the traditional British sports car virtues of quick steering, sharp cornering, good brakes and addictive acceleration."

When Barry created his line of Brooklands sports cars he certainly put a lot of time and thought into their design and development. Even the name conjures an exciting image that is linked with the MG marque. The namesake of Barry's cars is the famous Brooklands racetrack in England where several world land speed records were set as well as the breaking of the 100 mph speed barrier. MG played a major role at Brooklands during the early years winning numerous prizes including the 1930 Double Twelve-hour race with works-prepared M-Type Midgets. Brooklands is a fitting name for a car that reflects a fine British heritage. Better yet, it's made in Canada!

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Martyn has produced a new video that captures seven minutes of fun from British V8 2006! See our cars driving the famous "Tail of the Dragon", near Townsend Tennessee. Here's a link the video: www.youtube.com/watch?v=wqktVK3N-R8

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Got a tip for next issue's Canadian Corner? Contact Martyn Harvey at harv8@sympatico.ca

Martyn's cars:
1974.5 MGB GT
1975 TVR 2500M (Chevy V8)
1977 MGB V8 for sale!
1979 MGB LE V8
1980 MGB LE V8

(This is an example of the kind of photo we're looking for in our "Banner" class.)

Announcing: The British V8 Newsletter Photo Contest!

Date: January 6, 2007

One benefit of moving The British V8 Newsletter online was to facilitate sharing colorful photos of the cars we love. If you poke around on this website you'll find over 2300 photos so far, and we add more almost every day. Cool! But frankly, in my humble opinion, two things could improve. Number 1: I'd really like to see more photos of PEOPLE HAVING FUN with their cars. Number 2: I could really use some help finding glamorous photos to keep the main pages of the website looking "fresh" for frequent visitors and to spice-up general-interest newsletter columns.

These two selfish desires are the impetus behind the two classes of our first-ever **British V8 Newsletter Photo Contest**! The rules will be simple, the judging will be arbitrary, the prizes will probably be almost non-existent... but there's still a big reward for participating: we'll all have some great photos to look at! Interested?

Here Are The Rules

"General" Class:

The theme for this class is "People Having Fun With Performance-Modified British Sports Cars." To be a winner or runner-up in this class, photos must include both people and cars. No exceptions. Second rule: it must be possible for a "reasonably knowledgeable enthusiast" to spot some detail of the car that's modified from "original". Either the people or the cars can be the emphasis of the photo. Points will be given for composition and craft... but also for how much fun the people are having and for how cool the performance mods are. Winners will be selected at the discretion of the judge or judges.

Most of the photos on our website are displayed 600 pixels wide by 450 pixels tall. The photographer needn't be concerned about this, but the judge or judges will be asked to give preference to photos that look good when re-sized or cropped to this size. (Please see the General Submission Guidelines.)

(This example demonstrates our competition's theme: "People Having Fun with Modified British Sports Cars")

"Banner" Class:

The theme for this class is "Performance-Modified British Sports Cars." To be a winner or runner-up in this class, photos must show the modification in a glamorous way. Showing a badge, decal or painted logo that indicates or suggests the existence of a modification counts too. The photo doesn't need to contain people. Points will be given for the photographer's creativity, composition and craftsmanship. Winners will be selected at the discretion of the judge or judges.

Photos submitted for the Banner Class should look great when cropped or resized to 700 pixels wide by about 200 pixels tall. (See above for an example.) The photos may be cropped before submission, or the actual cropping may be left to the judge's imagination. (From my personal perspective, as editor and not as judge, the latter is actually preferable. Please see the General Submission

Guidelines.)

General Submission Guidelines

You may submit your photos however is most convenient for you, including e-mail. Our contact information can always be found here: http://www.britishv8.org/British-V8-Contact-Info.htm If you're submitting the photos as digital files, then "the higher the resolution the better". If you submit the photos by physical mail, please indicate whether you want them returned. (It wouldn't hurt to include return postage.) You may submit however many photos you like. If you submit a photo that meets the criteria of both classes, it will be judged separately in both classes.

No matter how you submit your photos, we ask that you document them as follows:
a) Please specify your full name, how we should credit you, and how we may contact you.
(Include this with all submitted materials.)
b) Please only submit photos that you took yourself.
c) Please advise us the names of any people who appear in the photo, if you know their names.
d) Please advise us the owners of the car/cars that appear in the photo, if you know their names.
e) Please advise us the make, model, and year of the cars. (Generally, the more info the better!)

Some photographers like to develop their own film. Others like to alter their photos digitally. The contest rules neither restrict nor prohibit this, but we don't particularly want to encourage it either. Generally, high resolution un-altered images are what we prefer to receive. Please note, however, that we routinely modify photos before showing them on our website. For example, we use several optimization tools and techniques to reduce digital file size. We also frequently crop, re-size, and brighten photos. We have a weird habit of airbrushing out at least one or two digits from license plate numbers (unless they're vanity plates).

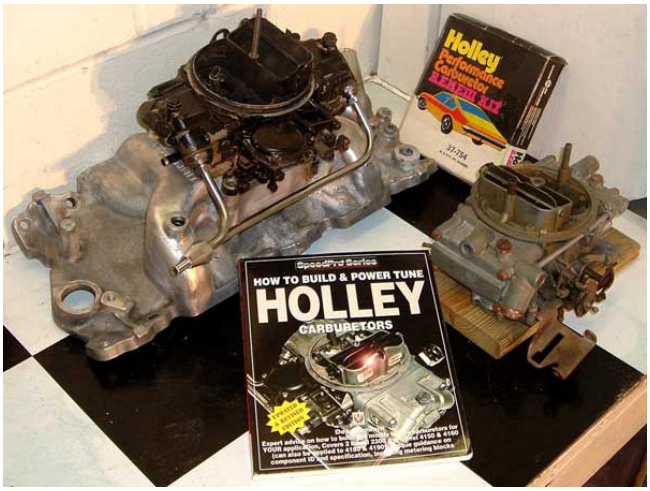
Participating in this contest implies that you're making the photos available to The British V8 Newsletter for use at our discretion. We will credit you as the photographer, but we will claim copyright rights on any and all photos that appear on our website or in our newsletter. If you don't own a photo or if you're uncomfortable with our having the right to display it, please don't submit it.

Judging, Awards, and Deadlines

We're in the process of recruiting impartial judges. (Contact me if you'd like to volunteer or nominate someone!) At this time, I haven't even thought about awards. (Contact me if you'd like to sponsor the contest and provide awards!) The deadline for all entries is July 1, 2007. Winners will be announced at the British V8 Meet in August!

I wish everyone good luck and hope everyone who participates enjoys this informal competition!

Sincerely,
Curtis Jacobson, editor



Book Review: "How to Build & Power Tune Holley Carburetors"

as published in British V8 Newsletter, Volume XIV Issue 3, December 2006

by: Greg Myer

Book: "How to Build & Power Tune Holley Carburetors"
Author: Des Hammill
Publisher: Veloce (Speed Pro Series)
128-pages, 125 color photos
ISBN: 1845840062

Most of us in the British V8 community are familiar with Veloce Publishing, a firm based in Dorchester, England. They produce what we want; information about our kinds of cars and the way to make them work the way we like, such as: "How to Give Your MGB V8 Power" and "How to Improve MGB, MGC & MGB V8" (both by Roger Williams). Their Speed Pro Series also includes titles covering such useful subjects as Power Tuning the Rover V8, Power Tuning Midgets & Sprites, Building and Modifying Sports Car Suspension, S.U. Carburetors, Nitrous Oxide, Ignition Systems, and much more. It's a valuable source of knowledge for those of us who need it.

This offering about Holley carburetors piqued my curiosity. Could a British Publishing House produce useful info on Holleys which are manufactured on this side of the pond? After all, Holleys are used here on all shapes and sizes of engines for a large variety of street and motorsport disciplines. The hod-rod magazines constantly have articles on ways to improve them. I have used Holleys for years and I'm familiar with them. What more could a British point of view do for me? The answer, it turns out, is quite a bit!

This is a very interesting book. Lots of diagrams, photos and graphs drive home the points made in the text. This is a reference work I'll read, use and refer to many times. This is not just for rebuilding carburetors; in fact it's not about that at all. True, there are many details about which you need to take notice of during a rebuild, but this book does not take the place of the directions supplied with your carb kit.

Rather, we find that it helps us see what we need to be looking for, first of all, and then what can be done to adjust or modify the particular circuit or function to suit your needs. I like this approach.

What this book doesn't do is tell you what your motor needs. You need to determine that, mostly by trial. Whether you have a new carburetor or rebuilt, there are more than a few adjustments that can affect power and economy. What we want is an efficient engine; making the best use of the fuel it's being fed. The methodical approach here in Hammill's book is excellent. Idle circuits, off-idle, power valves, accelerator pumps, main jets, primaries, secondaries - both mechanical and vacuum are all covered nicely. The different types of float bowls, and metering plates and blocks get their share of pages too. Another thing I enjoyed was the fact that many of the carbs and parts photographed were used. Somebody gets their hands dirty!

There is a chapter on manifolds. The basic difference between 360 degree and 180 degree manifolds is explained and what they are designed for. Mostly, the photos are of small block Ford intakes. I think there must be more Fords in the UK than Chevies. It's nice to see something a bit different for a change.

Do you know the difference between straight and 'dog-leg' boosters? It affects power. Most vacuum secondary 4 barrel carburetors have straight-leg boosters whereas all mechanical secondary carbs come with 'dog leg' boosters. This single advantage is one of the reasons why Shelby American used a 715 CFM carburetor in the 1960's rather than a smaller carb that would have been more appropriate for the engine size. Neat!

Can you modify your carburetor with better parts? Be cautious, not everything is interchangeable! In fact, if you're like me and pick up used carbs to rebuild or just for parts, there is information about which metering plate or block came with which carb number. Used carbs could have the wrong one. It's easily possible to build a useless carburetor which will give you all sorts of headaches.

On the other hand, there are ways to get even better performance out of even a brand new Holley. To find out what they are you need this book. It's not just plug in the latest trick part and go. You need to tune and test to find the best results for your combination. Remember that your combination includes not just the motor with its cam, compression, etc. but the weight of the car it's pulling, and the gearing too. All of these things affect the fuel requirements of your motor.

My Jeg's and Summit catalogs both have several pages full of Holley trick parts as well as aftermarket parts to upgrade your carburetor. Will I need center-hung floats for the autocross at the British V8 Meet in Ohio in August 2007? How about the on track dicing out at Nelson Ledges? How about some of the other parts available? This book doesn't cover all aftermarket parts, but it does give you enough information and direction for testing so you can decide for yourself.

Needless to say, I enjoyed this book. I'll put it to good use. What did I find to criticize? Very little. There is what I would call a misprint on the captions on pages 34 and 35. Here the right or left side of the carburetor is from the perspective of a person standing in front of the carburetor. That's not the way we do it here in the States. Right and left is always from the perspective of one in the driver's seat. That's for the car and all its parts when installed. It's a little detail, but might cause confusion for some. Other than that, no problem!

You can get started on your own Holley carburetor project without breaking the bank. I pick up used carburetors when I can and have bought NOS rebuild kits off eBay very reasonably too. With the guidance of this book you'll know just where to start and what to do.

Will I be ready for the British V8 Meet 2007? That remains to be seen. But if I'm not, it won't be for lack of information about building and tuning Holley carburetors.

How I Became Hooked On Alpines

as published in British V8 Newsletter, Volume XIV Issue 3, December 2006

by: Rob Wiseman

In 1973, shortly after my wife's second car wreck in as many years, she came home and said she had seen a cute little car that wasn't too expensive. So off I went to look and the "cute little car". What I found was a 1961 Sunbeam Alpine. I fell in love with it immediately even though it was going to be her car. I bought the car for $300, drove it home, started cleaning it up, and sanding off some rust. I worked on keeping it running as it was her daily driver. About a year later in 1974 she tired of the car and me and so she left.

Now it was my car but the divorce required me to sell the car and split the proceeds with her. In 1975 I sold my Alpine to a client. My client painted the Alpine, did some upholstery work, and sold it to another of my clients. In 1977 my client deleted the Alpine from his insurance policy. (I am an insurance agent.)

Fast forward 20 years. In early 1997 I saw a little red Series V running around town. I stopped by the guy's house to take a look and fell in love with Alpines again, but this guy was not going to sell. So I called my client who last had my Alpine and asked who he sold it to. He said he still had it in his garage. So I went down to his shop and there she was sitting in the garage covered with dust. The license plates expired in 1977. I asked him why he had parked it and he said the key was broken off in the ignition. I asked him if I could buy it back and he said it wasn't for sale. As the weeks ticked away I stopped by to see my Alpine about every two weeks and see if I could talk him into selling me my car. No deal. Finally in September of 1997 I stopped by again and asked if I could buy it back. I guess he knew I wasn't giving up but he wouldn't set a price. Finally he said there was a '49 Dodge for sale down the road and I could trade him that car for my Alpine. So I bought the 49 Dodge for twice what it was worth and was back at my clients shop with the Dodge within 2 hours. The trade was made. My '61 Sunbeam Alpine came home again.

During the 7 months or so that I had been trying to get my Alpine back I started doing research on the web. I found numerous internet sites with information about Alpines. At the time the best resource I found was the internet mail list. So I started asking questions on how to get the car running again. I towed the car to my garage and started working on it. After a few weeks I had it running and driving around the block every weekend. I was a long way from getting it licensed because the electrical system was pretty shot. I would get one light to work, then another, but not two at the same time. After more research I discovered that my beloved Alpine didn't even have an original Alpine engine. Prior to my first ownership of this car someone had but in a smaller engine from (if I remember correctly) a '49 car. The engine was so weak I could hardly get it to go faster than about 35 mph! After working on the car for about 3 years I was disillusioned and ready to sell the car because of the engine and the wiring.

I actually listed my Alpine for sale. While waiting for the offers to roll in, I came across an article on the internet about a guy named Joe Rodriguez who converts Alpines to V6 power. Now that was interesting! I called Joe in about September 2000. Being a novice mechanic, I was feeling pretty intimidated. I asked Joe if a novice could do this engine swap and he said he would talk me through it on the phone. Okay I sent my money in and received my kit. During that time I was shopping for a Mustang II engine. I found an engine sitting in a junkyard Mustang about 60 miles south of my home. I brought the engine home and tore it apart in the back on my pickup with a shell on to keep me out of the early snows. I dropped the engine off at the machine shop and drove my Alpine to a larger garage to begin tearing out the engine and transmission.

I started working on this project in January 2001. I figured I would be back on the road by March. Yeah, right! I got the engine, transmission and what was left of the wiring harness out. The end of January I picked up my newly rebuilt V6 engine from the machine shop. I started fitting the engine and calling Joe. Fit the engine. Call Joe. Fit the engine. Yell at Joe. Joe was awesome. He would calm me down and explain patiently what I was doing wrong. If I would just listen to Joe, things would probably go a lot smoother. Finally after putting the engine and transmission in and taking it out to adjust the fit about 50 times (sometimes 3 times in a night,) I finally felt like I had the correct fit and alignment. I had my friend weld-in the engine mounts. Then I took the engine out and finally painted the engine bay.

Okay now it was March. I put the engine in for the final time. Now what? The wiring needed to be done. I purchased a harness from Painless Performance. This was my first go at automobile wiring, so I went with a kit with good instructions. Within about a month I had most of the wiring in and working. "E-day" was finally here! E-day being the day I start my new engine for the first time. My friends from around my shop who had given me a hand here and there came over to help me get it going. We primed the engine and pretty much on the first try it started up and ran. WOW, WHAT A FEELING!!!

I think that was about June and I still had quite a bit to do before I could get it licensed, but summer was here and my buddies decided it was time to golf. My car sat until fall. I drove about 10 miles with just the headers on to a good muffler shop and had the exhaust put on. Finally in about October 2001 I was ready to license my car. I drove to a garage of a friend and he performed my state inspection. Passed! I got my new license plates. Finally after 24 years of not being on the road I was ready to roll. The snow started falling and I put my car in the garage again.

I decided in January 2002 to try my hand at body and paint work. Having never done this before, I spent a few months doing research while I was had stripping my car. Stripping the paint and patching a few rust spots took several, okay 6 months or so. Finally I thought I was ready to paint. "Not so!" said my friends who paint cars for a living. I have to do some sanding and plastic work. Okay put some primer on... Sand most of it off... More primer and some plastic... Sand most of it off... Maybe some more primer, and off course some more sanding. I thought my arms were going to fall off! I sanded and sanded and primed and sanded for months. Not every day but probably twice a week. Finally in January 2003 I was ready to paint. So I put on my paint and my friends said it was okay. Okay was not good enough so I sanded some more and then I was ready to paint again.

I pulled my car over to my friends paint shop, which was much cleaner and had way better lighting. As I painted my car, my friends would stand there and yell instruction to me. I gave her about 4 coats of color and 4 coats of clear. Looked awesome! I drove back over to my shop to start putting everything back together. "No! No! No!" my friends said I was not ready for that yet. I had to "cut and buff". Okay after a few weeks of various levels of cut and buff my friends gave me the okay to put my car back together.

New windshield, new dash, new seat covers on some old seats. Finally in about June 2003 I was ready to roll. I drove around quite a bit and had lots of fun but in July I went for a drive on a really hot day and I overheated a bit. (Not real bad, but not to my liking.) Back to the shop! Golf season was once again upon me. Car sat until late fall when I pulled the radiator and had it re-cored with a heavy duty core. During the winter, I put the radiator back in the car and I was ready when Spring came around. That was Spring of 2004. I decided I needed some carpet so I had someone do the carpet for me.

Now my car looks great, drives great, and I feel great. In May I decided to drive to a car show about 200 miles away. The night before it, driving home from work, my friend pulls up next to me and says "Your wheel is wobbling." S*&#! I called the best mechanic I know. He looked at my suspension, said "No way. You can't drive that to Moab." So we took the front suspension apart and replaced all the main parts. Now it was gonna drive like a dream; or so I thought! I drove home, but my front wheel was still wobbling! I guess we just assumed what we did fixed it. So I called my buddy and he met me at his shop. He took one look and said the front spindle was bent. He said I was S.O.L. I told him I could have another spindle in one hour. (I have been having so much fun I bought another Alpine). He started the tear-down while I went to my shop and got another spindle. We put in on, and I made it to the car show in the morning!

Last July I went to the SUNI in Park City, Utah. I did autocross and a judged car show. My car placed in both events and that just helped to encourage me to finish my #2 Alpine.

I know this is long but that is how I became hooked on Alpines.

Rob Wiseman

61 Sunbeam Alpine V6 (shown above)
61 Sunbeam Alpine V6 (project car)

Ford 5.0L EFI Installation in an MGB

as published in British V8 Newsletter, Volume XIV Issue 3, December 2006

by: Kelly Stevenson

If you're interested in installing an "electronically fuel-injected" (EFI) small block Ford V8 engine in an MGB, the first decision you'll make is probably whether to start with a complete donor car, a salvage yard engine, or an already built "crate" engine. In deciding between potential donor cars, you'll probably focus on '88-'95 Ford Mustangs, Ford Explorers and Mercury Mountaineers.

Many companies build (or remanufacture) Ford engines and sell them as crate engines. Ford Racing also has crate motors for sale. Horsepower ratings on crate engines appear to be a marketing fiction. At best, they assume optimized conditions. Generally the Mustang guys experience only about 260 rear wheel horsepower from their "345hp" rated Crate engines. Furthermore, many crate engines are sold in "long block" form, which means they don't include the fuel injection system. This article is specifically concerned with OEM EFI.

In comparing Ford-OEM EFI systems, one of the first things to note is that Ford used two different sensor technologies to measure the amount of air entering the engine. The "engine control module" (ECM) must know how much air is entering so that it can provide the appropriate matching amount of fuel. Furthermore, the fuel map is programmed to be different for cars with different specifications. (For example, manual transmission cars may typically be programmed to idle at a slightly higher speed than automatic transmission cars.)

The two basic sensor technologies to choose between are "speed density" and "mass air". The speed density system came first (generally around model years '85-'88), and it's adequate. Speed density systems rely heavily on manifold air pressure (MAP) sensors as a further input to the ECM in order to estimate engine load. Mass air systems (from about model years '89-'93) use a hot-wire sensor to actually measure the air flow entering the throttle body. (Passing air cools the element, which changes its electrical resistance.) Instead of a MAP sensor, they use a barometric air pressure (BAP) sensor. They also use two oxygen sensors, an air charge temperature (ACT) sensor, an engine coolant temperature (ECT) sensor, and a throttle position (TPS) sensor. Don't let all these sensors intimidate you! Their electrical connections are all different so they can't be crossed up. The two important things you will want to note are: (1) that none of the electronic parts of speed density systems are interchangable with the later mass air system parts, and (2) the mass air systems are much more "tune-able". In fact, the mass air systems are preferred because they're actually self tuning: their ECM has the ability to modify or "learn" changes as they occur and to adapt to them. (For example, the mass-air ECM can adapt better to changes in altitude or fuel quality.)

MAF sensor (PMAS brand) and cold air intake tube.

The ECM that Ford used on their mass air sensor EFI systems is known as an "EEC-IV" module. (The acronym stands for "Ford Electronic Engine Control version Four".) All EEC-IV ECM's are NOT the same. The programming is different, based on vehicle specs.

If you start with a donor car, the ECM, the main wiring harness, auxiliary wiring, and all the various and sundry small parts needed are all included! The ECM that came with my donor 1993 Mustang LX is an "A9L" EEC-IV, and I have been happy with its programming.

If the vehicle wiring is damaged or missing, purchase Ford factory replacement harnesses. (Note: part number M12071-C302 is the main engine harness for a '93 Mustang LX). You can also purchase a mass air harness package complete with sensors. (For more information on wiring, the Mustang online bulletin boards are a valuable resource. Also, the Ford Fuel Injection Manual is ISM# 12071-302 and is strongly recommended. You can order a printed copy from Ford, or download a copy from various online sources.)

In addition to the main engine wiring harness, there are usually three smaller harnesses: one for the fuel injectors, one for the alternator, and one for the "heated exhaust gas oxygen" (HEGO) sensor. If you have a donor car, these should all be there.

We removed tape from the main Ford harness and relocated the coil connector. The coil is now mounted to the front of the left head. The HEGO connector, positive power wires (solenoid) & ECM grounds are all on the passenger-side of the car to ease connection to the MGB harness. We chose to plug the Ford temperature sender hole and drill the Ford thermostat housing water outlet for mounting an MGB sender. The MGB sender is an odd size (5/8"X 18). This change required that the temperature wire be removed from the injector harness and routed up the right side of the lower manifold.

We removed the MGB front fan relay and stripped the white & brown wires out since they are needed to power the Ford system. (White is "ignition switched power" and brown is "battery power".) The start or "crank" wire came from the OEM MGB starter relay and connects to the big Ford relay solenoid. The dedicated ground cable from the battery also mounts to the ECM ground just below the Ford relay. (Note: reliable grounds tend to be extremely important on an EFI engine!)

The MGB ignition light is connected to the Ford wire that performs the same function (noted in the wiring manual) so the dash charging light functions also.

We made a "check engine" light from an orange LED (Speedway Motors 911-31050-orange). This was mounted in the radio console on the left-hand side (visible to driver only).

We chose a modified "March Performance" pulley system to drive the alternator and water pump. The alternator was moved to the driver-side of the engine bay, and its top mounting ear was cut and re-welded with the housing clocked to allow maximum space for coil and valve cover. (A local alternator repair shop handled this modification.)

ECM, mounted behind passenger-side wheel splash panel

BAP sensor near driver-side hood hinge

Engine harness connectors

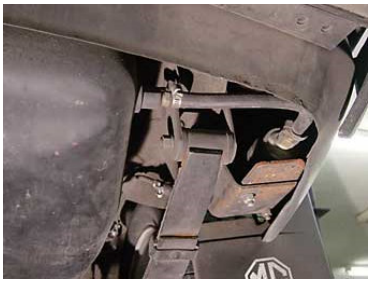
Remote oil filter at left rear and HTOB lines

We chose to mount the Ford ECM in the recess behind the passenger-side front tire (covered by the bolted-in "splash panel"). We made a sheet metal enclosure, that's open at the bottom, to further protect the ECM. Be sure to reverse the mounting bracket to the outside wall since the original mounted on the inside of the car. This will allow the wiring to enter from the front. The Ford EFI Manual gives the procedure for cutting the oblong hole to fit the grommet on the main wiring harness. This manual is available online, or comes with the OEM replacement wiring harness.

The Ford manual further details the color codes of wires that need connection to the MGB wiring. On the transmission, the wiring needs to be connected to the "vehicle speed sensor" (VSS) and reverse-light switch, and the neutral safety switch. The VSS is hooked to the corresponding wires running to the ECM while the back-up-light switch is wired direct to the MGB wiring for the same circuit. (The neutral switch is not needed for operation, but will cause the ECM to record code "67" every time you pull codes from ECM.)

The "barometric air pressure" (BAP) sensor easily mounts just to the left of the heater housing. The main harnesses are routed behind the washer bracket.

The gas vapor canister and purge valve are mounted just behind the OEM washer reservoir bracket.



Driver-side of fuel tank, and fuel pump mounting

Fuel filter & EFI line connections to engine & return line to old MGB line

What fuel tank modifications were required for EFI? Modern EFI systems incorporate a high pressure supply line and also a lower pressure return line that takes excess fuel back to the fuel tank. We decided to use the original (late-model) MGB fuel level sender's integral fuel pick-up tube for "return". To make this work out, we modified the pick-up so that it turned away from the tank's sump to eliminate cavitation. With the fuel tank removed from the car, we drilled a hole in the passenger-side bottom corner of the tank (i.e. under the filler spout) and we bent a 3/8" steel line so that it laid in the lowest part of the sump with a filter sock attached. (Note: with the fuel-lever sender removed we could see what we were doing inside the tank.) We fabricated a flanged plug with internal pipe thread to mount a barbed 3/8" fitting outside and we mounted the steel 3/8" line to the inside of this plug. We then silver-soldered the 3/8" line into the plug and drilled a hole adequate to slip the plug, line & filter into the tank. The flanged plug & line was silver soldered to the tank and is leak free.

On our installation, most of the supply (or "pressure side") fuel line is 5/16" steel tubing (from Summit), but I would suggest you try aluminum for ease of fabrication. The one place where we used 3/8" steel line was in the immediate vicinity of the fuel filter. The 3/8" steel fuel line was sourced from a Chevrolet truck in the salvage yard. We preferred the Chevrolet truck fuel filter's threaded nuts (for 3/8" line) over slip-lock connectors. Our trick was to slip the end of 5/16" steel line inside short pieces of 3/8" line, and then silver solder them together. (3/8" line can easily be double flared for any unions.) We used a little flex line too: from the fuel tank to the pump. Regular fuel hose isn't up to the job, so make sure to get "EFI" rated hose. The OEM fuel rails were used along with the OEM fittings. (They required some bending to re-use). That's it for the supply side! As mentioned above, the MGB's original gas line was used for the return side.

Fuel pump: fabricated mounting bracket for MSD Electric Pump part number 2225 ($95 on eBay). This pump is plumbed for 3/8" inlet and 5/16" outlet. The mount was welded to the right rear factory tow bracket just behind the tire up inside the quarter-panel. The pump was bolted to another bracket to allow it to be removed easily and serviced if needed. It was powered from a relay in the trunk activated by the MGB fuel pump power wire. A separate fused wire runs to the battery and hooks directly to the relay. The MGB under-dash "upset switch" was eliminated and a Mustang inertia switch was wired-in instead.

Induction: a "CAI" (cold air intake) was made from a 3" diameter piece of tubing from a muffler shop. The tubing is mated to K&N Filter (part number RF1030, approximately $75). It was routed through the passenger-side radiator bracket and is secured to the slam panel in front and centered. A bell-shaped silicone hose (i.e. 4" X 3" transition) connects the tubing to the mass-air sensor, which in turn is connected to the Ford molded rubber elbow.

Driver-side header

Passenger-side header & oxygen sensor

Fabricating headers was the most time consuming and skill-intensive part of our engine swap. We purchased a Hedman header kit or "box of bends" for the Ford 5.0 (with 1 5/8" tubing). It had both left and right flanges and enough angles to complete our set with some left over. We also used 3" Flowmaster ball-flange collectors from Summit. The end results are good. The headers fit and work, plus we can change all spark plugs without any difficulty - but it wasn't cheap! Our total cost (not including labor) was in excess of $800 with more than 55 hours of our own fabrication work.

There are now cost effective headers specifically made for Ford-MGB engine conversions, in both thru-the-fender and block-hugger configurations, and you'll want to consider them.

Whatever headers you select, the EFI ECM requires oxygen sensors (two: one per cylinder bank) in the exhaust stream. We welded O2 sensor bungs onto the headers after some careful measuring to make sure the sensors wouldn't be damaged by the wheels at full wheel lock.

Finally, we sent our completed headers to Jet-Hot for application of their ceramic coating which provides durable corrosion protection and also performance benefits (because it helps keep heat inside the pipes). They provided very quick service. Suggestion: prior to coating, have the flanges trued or milled flat to prevent leaks later.

Ford EFI typically sits taller than a carburetor. A cowl type hood scoop or MGB-style bulged hood will likely be required, unless you're prepared to fabricate a special low-profile "spider" type intake manifold. The MGC-style hood I selected is fiberglass, and was provided by "Team Liebre" in Pennsylvania. (Editor's note: this model of hand-laid fiberglass MGC-style hood is no longer available from Team Liebre, but it is available from Tim Nagy at morSpeed Performance Products.)

Engine Specifications:
5.0 EFI Mustang, X-303 FPP heads, GT-40 Ford intake, 24lb. Ford injectors (in lieu of stock 19lb injectors), 65mm throttle body, PMAS 75mm mass air sensor, Comp Cam XE-264-HR-14 roller cam (could use more cam, but torque is great!), Ford Explorer timing cover, water pump, and harmonic balancer. Baseline dynamometer test: 266 RWHP & 298 Torque@ 4800rpm.

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Re-Curving Rover Distributors

as published in British V8 Newsletter, Volume XIV Issue 3, December 2006

by: Jean Monfort

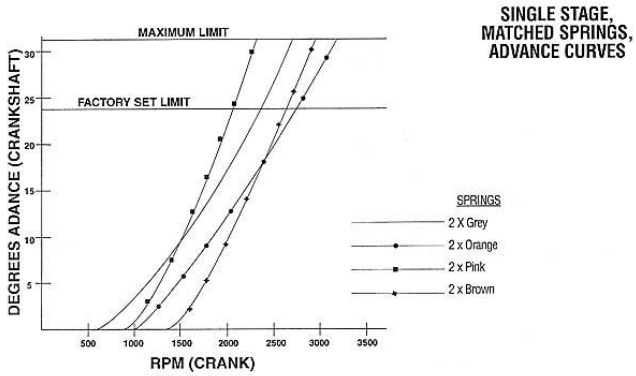
All engines must be equipped with the right distributor, giving the right advance curve. Especially on fast road engines or rally units, it is better to send 25,000 volts to the spark plugs at the right time than 50,000 volts too late or too early. So, in search of the best way to set fire to the gas, I collected some information.

First Issue: How Much Range of Advance?

In a previous article entitled "3. 2. 1. Ignition! Selecting a Rover Distributor" I explained how to enlarge the upper limit of mechanical advance on a Buick or Rover distributor. Without modification, these distributors only give a range of about fifteen degrees of advance. Such work is not necessary with Mallory distributors. Most Mallory distributors are factory set to limit the advance to 24 degrees, but can easily be adjusted from 0 to 28 degrees. A "fast-road" Rover/Buick (with 10 to 10.5:1 compression ratio) works well from 8 to 10 degrees (idle) advancing to 32 to 34 degrees at 3000 to 3500 RPM (and over.)

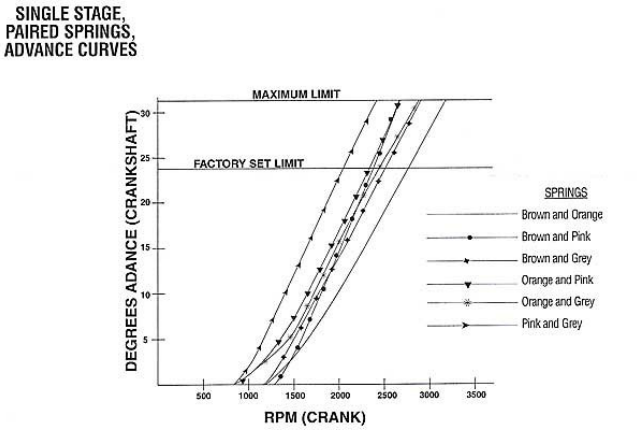
Second Issue: What about the advance "curve"?

Single-stage advance curves are common on 4 and 6 cylinder engines. Such curves are nearly straight and allow full or nearly-full advance from 2000 RPM, which is appropriate for race engines. With such straight curves, the ignitions on racing engines are relatively easy to tune. (Just use trial and error to find what advance gives the most power at high RPM.) Some single-stage distributor curves are so radical that they're only suited for racing V8's (e.g. Mallory 29.014 with YT or YH advance curve change kit) as shown in Figure 1:

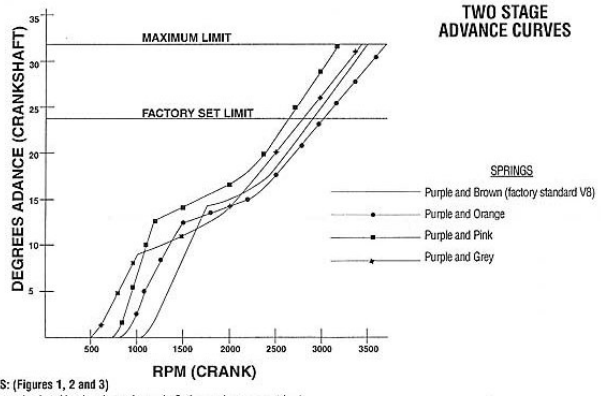


The following graphs demonstrate the importance of selecting springs - especially "paired" sets of springs. In paired-spring

distributors, one spring is typically longer and consequently it remains loose until over approximately 1500 RPM. (Just to put ideas into the guys who are not running a Mallory...!)



By changing the spring combination on a two-stage advance curve distributor, one can achieve quicker advance to 1500 RPM, slower advance change at mid RPM, and full advance from about 3000 RPM. Studying this illustration suggest that a great distributor can be made without any sophisticated, digitalized or twist button systems.



NOTES: (Figures 1, 2 and 3)

1) Curves developed by changing springs only. Spring perches were **not** bent.
2) Purple and brown spring combination is factory standard for most Mallory V8 distributors.
3) Exact curve obtained from any combination of springs may vary slightly from those shown above.
4) Most Mallory distrubutors for V8s have a factory set limit of 24° advance.
5) Purple springs must not be used in pairs. The purple spring should have slack (unstretched) when installed.
6) Curves may be shifted to the right by bending the spring perches to increase spring tension, or to the left by bending for less tension.

Third Issue: What about "dwell"?

The dwell angle adjustment determines the duration of the spark. (Dwell is normally set to 26-28 degrees on a stock Rover engine.) The only one way to have a long lived spark is to reduce the points gap or to modify the trigger's design (on an electronic ignition) - but I advise against doing that! It is better to go to a dual point system and subsequently to two sparks each cycle. For even more fireworks you must thrust your hand into your pocket and order a digitalized ignition!

Most stock Lucas get about 27 degrees of dwell angle, whereas the Mallory's vary by model as shown below:

	Point Gap	Individual Dwell	Total Dwell
Dual Point Vacuum	0.022	26 degrees	33 +/- 2 degrees
Single Point Mechanical & Vacuum	0.018	29 degrees	29 degrees
Dual Point Mechanical	0.022	26 degrees	33 degrees
Old Mallory Dual-Point	0.018	17 degrees	34 degrees

The following photo shows the Mallory spring kit (at top) and the Summit Racing kit (below). (Note: Summit kit part number

SUM-G5212 fits GM HEI 74/79 non-computer distributors.)

Fourth Issue: Mechanical or vacuum advance?

I personally prefer mechanical advance distributors for their simplicity, efficiency, and because the vacuum chamber presents a potential failure mode. The risk of rupturing the rubber diaphragm is real when running a four-barrel carb. One work-around is to install a Range Rover vacuum reducer (made in USA!) in the line. The part number is: ERC 6997 and it can be found on any 3.5 / 3.9 Discovery or Range Rover up to 1994.

Disclaimer: This page was researched and written by Jean Monfort. Views expressed are those of the author, and are provided without warrantee or guarantee. Apply at your own risk.

Photo 1: Buick 215 Distributor, Cleaned Up and Torn Down

Mechanical Ignition Advance

as published in British V8 Newsletter, Volume XIV Issue 3, December 2006

by: Jeff Schlemmer, proprietor of Advanced Distributors, LLC

For folks who are interested in recurving their own distributor, I'm going to attempt to explain the basics of how to make adjustments and where they are made to achieve a well rounded ignition curve. First things first: you must start with clean, well-lubricated parts! Your ignition curve will never be consistent if pivot points are binding from dried grease or if the bushings are sloppy loose.

Many versions of Rover and Buick distributors have been used over the years. The unit shown in this article came from a 1961 Buick 215. It was not a low mileage engine, and these parts looked like they would never be used again. If you're working with similarly aged components, you'll likely find that the whole works needs to be soaked in penetrant before you'll be able to remove the shaft at all, due to dried oil build-up between the upper and lower bushings.

The amount of total advance offered by any distributor is adjustable, and in most cases 10-12 degrees of advance will get you in the ballpark. In Photo 2, the pink arrow highlights the adjustment mechanism (i.e. a pin which moves within a hole or slot). The width of the hole is the amount of advance that is allowed. The proper way to change the amount of advance available is to weld the hole smaller or to grind it larger. A few thousandths of an inch goes a long way! The hole shown here offers 17 degrees of advance. Obviously, it would also be technically possible to resize or reshape the pin. More commonly, when less ignition advance is desired, a bushing is slipped onto the pin and secured in place with a small circlip. Recurve kits for some models of distributor include a bushing or two for this purpose, but in the case of this Buick distributor the pin hangs upside down above the points. I believe it would be in the best interest of distributor to make a permanent repair, because a failed clip might result in a destroyed distributor.

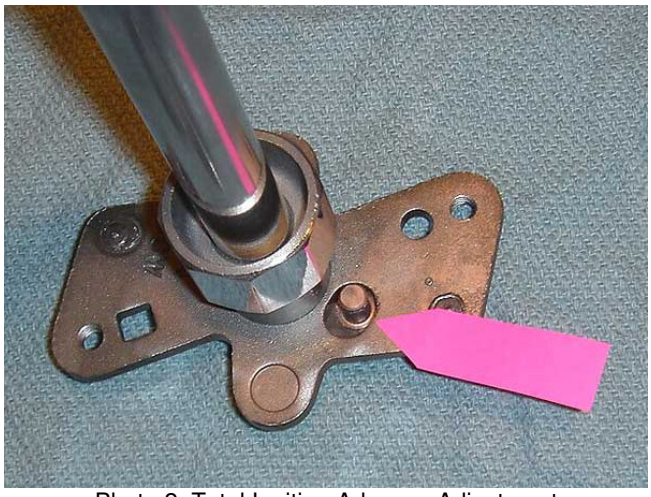


Photo 2: Total Ignition Advance Adjustment

The rate of mechanical ignition advance is determined by two important factors in these distributors. The springs are the most obvious, but the advance cam is equally important. In Photo 3, the peach colored arrow highlights the curved ramp that the weights follow as centrifugal force stretches the springs and allows advance. As the weight rotates across the length of the arched ramp, the radius of the curve determines the speed of advance onset. If the contact surface of the ramp starts basically "flat" for the first half of

the weight's travel path, and then has a sharp radius for the second half, you'll get a fast onset of mechanical timing advance followed by a slow finale. In this case, however, we find a relatively even radius the entire length, so the curve will be smooth. This is what I like to see for most street-performance applications! In some later model distributors, you will find that the advance cam can be removed and replaced. Some Delco recurve kits offer replacement cams with different advance rates, or you can weld and grind the existing unit to achieve virtually any desired results.

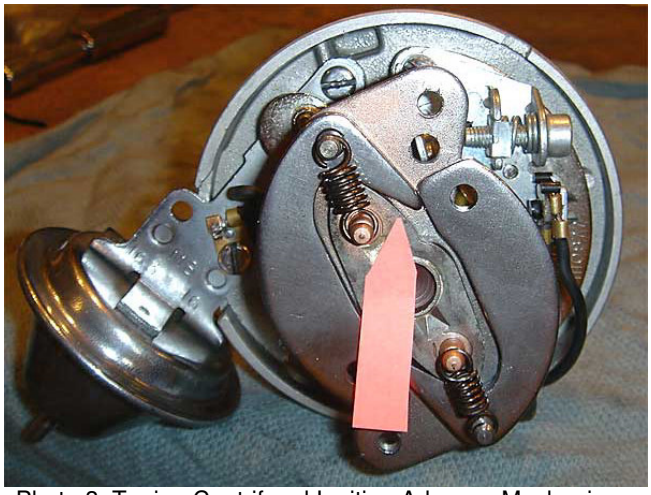


Photo 3: Tuning Centrifugal Ignition Advance Mechanisms

The selection of advance springs also affects how the ignition advance curve relates to engine rpm. Replacement springs come in different strengths and lengths, and as a practical matter there can even be significant variability in springs that look quite similar. It's a great convenience to have a lot of springs available. By using a precision spring force measurement tool and also by measuring spring length, springs can be selected that will provide more predictable performance results.

Obviously, the distributor shown here has two springs. It is often desirable to select two springs that are somewhat mismatched. A lighter strength primary spring (primary meaning the first spring to engage) used with a loose fitting but relatively strong secondary spring will allow fast immediate advance at low rpms, but a long, slow second half of the ignition curve. Compare this to a pair of moderate strength matched springs and you can have a difference of 10 crank degrees at mid-advance rpms, even though the start and finish points of the curve stay virtually identical.

The general rule of thumb is that the ignition curve should start just after idle, and be "all-in" around 3000 rpms. There are many factors that change the engine's needs, such as compression ratio, type of carburetion, cylinder head airflow, type and model of camshaft, as well as a long list of factors that need to match the driver's needs such as fuel mileage, choice of transmission (overdrive or not), highway driving, or drag race use.

Remember, when you chose an ignition curve for your engine, you should think of the bigger picture. The amount of distributor advance should be figured from the amount of total advance your engine can handle without losing power or pinging, minus the amount of advance your engine can tolerate at idle. Most drivers want a smooth idle, but others prefer just a little choppiness to show off a high performance cam. Some folks don't care if it idles at all, as long as it screams down the drag strip! A bit of playing with your current distributor can help determine what will work best in your one-of-a-kind car: find the best timing setting at idle, find the best timing setting for above-3000 rpm driving, note the side effects at other rpms if there are any, and with all these details considered you can map your own perfect ignition advance curve.

But that's only part of the story. Once you have mechanical ignition advance all figured out, we can move on to vacuum-advance affects on performance and fuel economy.

Keep in mind that if you decide to recurve your distributor, there are many, many decisions to be made and just as many adjustments. Patience will be of the utmost importance. Many adjustments may need to be made several times before they are perfect. If you think that making any of these repairs or curve decisions is out of your comfort zone or skill level, there are still a few experienced and skilled professionals who would be happy assist you.

Drive fast & take chances!

(Editor's note: "Effects of Vacuum-Advance on Performance and Fuel Economy" and "Special Equipment and Techniques used by Professional Distributor Technicians" will be subjects of future British V8 Newsletter articles by this author. Stay tuned.)

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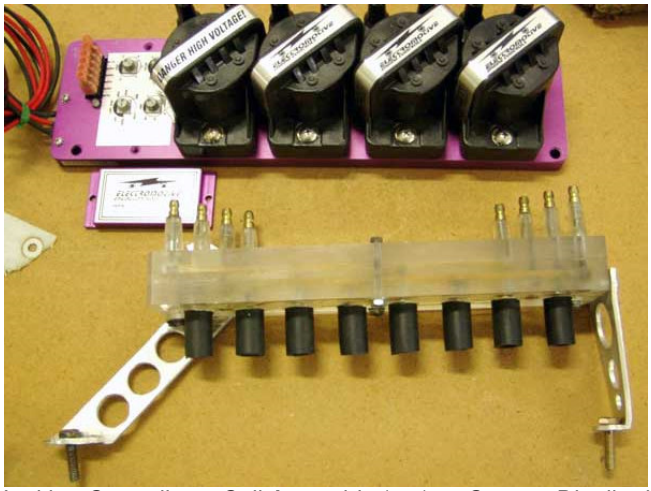


Electromotive Direct Ignition Controller & Coil Assembly (top), & Custom Distribution Manifold (bottom)

Direct Ignition and Tuning Equipment

as published in British V8 Newsletter, Volume XIV Issue 3, December 2006

by: Howard Fitzcharles

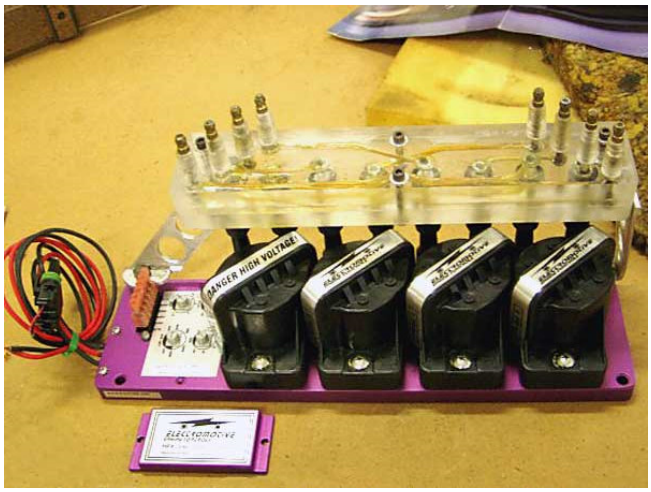
Distributor ignition is OK up to a point, but when you look at the drive of most distributors you will see a lot of free play between the piston position and whatever is in the distributor that actually triggers the coil. Whether it's a set of points, a light emitting diode, an electromagnet or whatever. Then you have to fire a coil, sending current to the distibutor cap, along to a carbon brush, then to a rotor, jumping a gap to a peg, and back out of the cap to a wire before it gets to the spark plug where it is trying to jump another gap to light a fire in the combustion chamber. Whew - what a trip!

Maximum horsepower, as far as ignition timing is concerned, occurs when ignition timing is advanced right up to almost the point of detonation. In other words, if you were to advance your timing slowly until you got detonation you would see horsepower increase until you reached an abnormal combustion (which is commonly misnamed valve ping or valve rattle). The trouble with detonation is that high RPM detonation is not easily heard, unlike the low-RPM-under-load detonation "rattle". With gear lash and timing-chain stretch causing loose play in the drive of a distributor, at speed the drive is bouncing back and forth so you must keep the timing slightly retarded to account for the variation in the actual timing. You have shorted yourself on power because you are forced to run a slightly retarded timing because of this "spark scatter" variation. An ignition that is triggered directly off the crankshaft is much more accurate and consistent.

Because a more consistent initial signal allows more timing advance, higher combustion chamber pressures are achieved. The final result is that the engine produces more power!

What about ignition timing through the RPM range? Most Kettering ignition (standard "points type") systems use a combination of vacuum control and centrifugal controls to get the timing close to what is needed through the RPM and load range. Here, they really get sloppy and - guess what! - as soon as you make any significant modifications to your engine you completely change the needed advance curve of the distributor. You can NOT guess what this new curve is. You will need a "distributor machine" to even change the curve. And guess what again! You may find it hard to even find one in your town. Call some repair shops and see. A race car shop will be your best bet. What curve is best for your particular engine can be different than another identical engine.

What to do? It's simple: Direct Ignition! In a typical direct ignition system, a trigger-wheel is mounted on the crank pulley and a sensor (called a "pick-up") is mounted close to that wheel. Crank position, as sensed by the pick-up, is the basis for ignition timing. Direct ignition also uses a different coil strategy, wherein the ignition fires spark plugs directly from multiple coils and not through a distributor cap and rotor. Each coil has two spark plug wire terminals that are in turn wired to two conventional spark plugs. (One spark plug fires on compression while simultaneously the companion spark plug fires simultaneously on exhaust.) The advance curve is handled electrically; knobs on a control panel allow a user to dial in the advance through several RPM ranges. Using these controls, one can optimize the advance curve to match your particular engine. One of the dials is a rev-limiter adjustment. A MAP sensor senses manifold pressure changes, as another input to the electronic controller.



I have selected an Electromotive brand direct ignition system for my Buick 215cid V8 engine. One thing that sets the Electromotive "XDI" system apart is the ability to charge multiple ignition coils at the same time. The resulting benefit is increased dwell time (up to at least sixty degrees and about 1000 microseconds). Unlike capacitive discharge systems that only put out one very short spark, the XDI puts out a fuller, longer-burning spark at high engine speed. The longer burn time assures effective burning of even lean or poorly balanced fuel mixtures. Full spark energy is available over the entire RPM range.

An optional timing control can be mounted inside the cockpit for fine adjustment of timing as conditions (such as temperature, fuel quality, etc.) change.

How do I know what to set the adjustable timing to? I use an LED display from a knock sensor system made by MSD. The knock sensor sends a signal to the display of LEDs. This way, no matter what the present conditions are, I can keep the ignition timing to an optimum by reading the LED display and setting the timing to it's optimum. The MSD knock sensor can read detonation and give me a display when I can not hear any detonation. This is especially true at high RPM. Detonation (abnormal combustion) can destroy an engine in just a few minutes of high RPM running.

If you are into fuel injection you will find that Electromotive has a cool system that handles fuel control also.

Another very practical tuning aid is called "G-Tech Pro", which is a computer that stores, analyzes, and reports the output of integral accelerometers over time. One use of the G-Tech analyzer is engine tuning: if you know the weight of your car and enter it into the computer, the device can calculate (wheel) horsepower based on the car's actual forward acceleration. I first saw one of these units in a friend's car a few years ago. (The "car" was a turbo-charged aluminum-block 350 Chevy powered Datsun PU.) My friend Oz had the engine on a dyno and knew what it should show as horsepower. We were impressed that the G-Tech numbers matched the actual dynomometer consistently.

G-Tech Pro has three accelerometers. One accelerometer measures lateral acceleration, which is very useful for tire and suspension tuning and driver training. G-Tech tools are a great tool for autocrossers!

A "z-axis" accelerometer measures up-and-down acceleration. This extra sensor provides a big technical advantage: G-Tech Pro can

automatically detect and compensate for suspension lift or dive which would otherwise compromise accuracy.

The basic model, called "G-Tech Pro SS", currently costs about $199. The "G-Tech Pro RR" (which replaces the now-obsolete "G-Tech Pro Competition" model) can interface with a laptop computer. At about $299, this unit costs less than a few dyno pulls on an engine dyno! I used to race motorcycles professionally and didn't have such tools so I had to make estimates by timing high speed test runs on straight highway. (Much more dangerous than racing on a race track!) With a G-Tech Pro you can make all of your tests and not spin a wheel or go over the highway speed limit. Cool!

Check out Howard's website! MG's, Triumphs & Jaguars: www.mg-tri-jag.net

Disclaimer: This page was researched and written by Howard Fitzcharles. Views expressed are those of the author, and are provided without warrantee or guarantee. Apply at your own risk.

How Does a Tandem Master Cylinder Work?

as published in British V8 Newsletter, Volume XIV Issue 3, December 2006

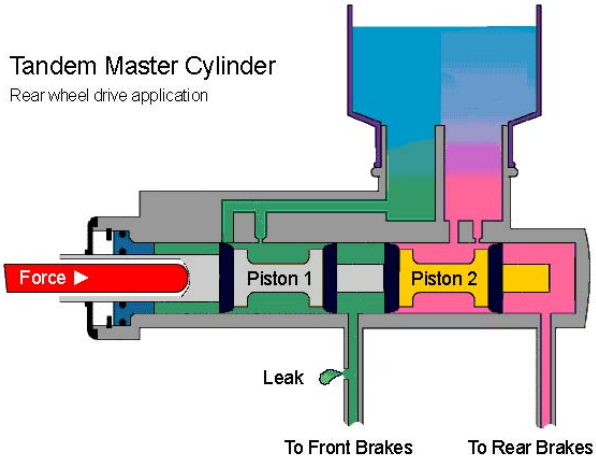
by: Curtis Jacobson

(Editor's Note: two articles have been submitted to this issue of The British V8 Newsletter that address performance modification of the MGB brake system. This article was originally conceived as a "sidebar" article to provide general background information to support these two articles. It should answer the basic question: "How does a tandem master cylinder work?" Over time, this article has grown in scope to include a few suggestions a person might also consider when evaluating the frequently asked question: "Should I upgrade my brake system?")

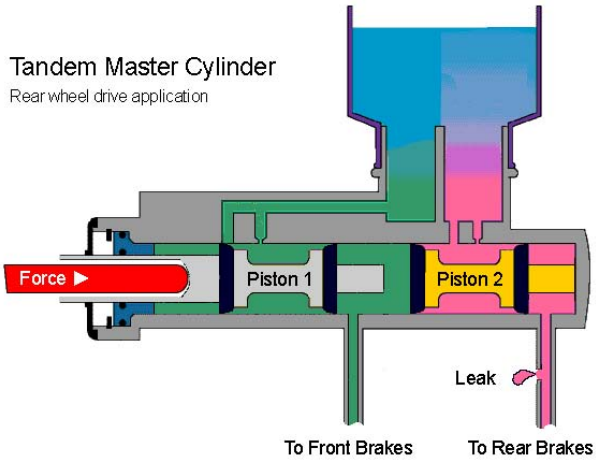
One of the most frequent questions asked by people contemplating an engine swap for their classic British sports car is "Should I upgrade the brake system?" It can be a difficult question. Most of these cars had excellent brakes by the standard of their day. Since the popular V8 and V6 engine alternatives are similar in weight to the original British engines, the actual need for stronger brakes isn't always clear. (If the brakes are strong enough that you can lock them up at will, you might be wise to spend your money on stickier tires before modifying the brakes.) However, several other factors may indicate a need for brake system redesign. First and foremost, most cars produced before 1968 will have single-piston master cylinders. A leak in brake plumbing anywhere on the car can render these brakes completely inoperable. If your car falls in this category, upgrading to a later model tandem master cylinder is strongly recommended.

A tandem master cylinder is characterized by two pistons operating in series within a common bore, as shown in the two illustrations below. In rear-wheel drive applications the piston that's located closer to the pedal (labeled "Piston 1") applies the vehicle's front brakes. In normal operation, fluid displaced and pressurized by Piston 1 also causes movement of a second piston ("Piston 2"). Piston 2 applies the vehicle's rear brakes.

The following two illustrations show how a tandem master cylinder isolates leaks in the front and rear brake plumbing respectively. (In both illustrations, the pedal has already been depressed to the point of brake application.)



As shown in Illustration 1, if a leak develops in the front brake system, Piston 1 will move forward until it contacts Piston 2. Force from the brake pedal will be transmitted mechanically through Piston 1 to Piston 2. Although overall braking performance will be severely compromised, the rear brakes will still be functional provided sufficient pedal travel is available. The pedal will need to travel further than normal to fully engage the rear brakes. Also, it should be appreciated that trying to stop quickly with just the rear brakes is very tricky because the rear tires will easily reach the point of lock-up. As the car is slowing, weight transfers forward and the rear wheels lose some of their much needed traction.



If a leak develops in the rear brake system, Piston 2 will move forward until it contacts the closed end of the master cylinder housing. Once Piston 2 becomes stationary, pressurization of fluid between the two pistons will apply the front brakes. Although overall braking performance will be significantly compromised, the front brakes will still be functional provided sufficient pedal travel is available. The pedal will need to travel further than normal to fully engage the front brakes. (Frankly, some inattentive or inexperienced drivers have been known to continue driving with non-functional rear brakes, despite longer pedal travel and longer stopping distances. For this reason, newer cars are fitted with brake failure warning lights.)

For purposes of illustration, return springs have been omitted from the two illustrations above. There are typically two coil springs in series: one acting between Piston 1 and Piston 2, and the other acting between Piston 2 and the closed end of the master cylinder housing. Although Piston 2 is shown fully forward in the second illustration, it is only held there (temporarily) by fluid pressure between the pistons. It might be of further interest to note that the illustrations above apply to most rear wheel drive cars produced since 1968 - but not to front wheel drive cars. Front wheel drive cars are normally plumbed differently, such that each piston applies one front and one rear brake cylinder (on opposite sides of the car.)

How does one go about updating a "single line" brake system? If your model of car was produced both before and after tandem master cylinders were mandated, it will probably be easiest to simply purchase and install later model components. Otherwise, you'll have to do some research... Generally, in selecting a tandem master cylinder there are several specifications of interest. One of the first to consider is bore size. A larger diameter piston will displace more fluid per unit of travel. Less pedal travel will be required for a corresponding amount of braking force at the wheels. Pedal effort will also be greater for a corresponding braking effect.

Another issue when selecting a tandem master cylinder is whether it is fitted with one or more internal residual pressure valves. On an OEM master cylinder designed for a car with rear drum brakes there will sometimes be a residual pressure valve in the rear brake circuit to maintain a small amount of pressure at the wheel cylinder seals, The amount of residual pressure varies from one design to another but typically is between 6 and 25psi. Disc brake calipers may or may not need a residual pressure valve depending on their design. A 2psi residual pressure valve is not uncommon for aftermarket disc brake calipers.

What other factors would influence an engine swapper's decision of whether to undergo a partial or complete redesign of his car's braking system?

Many people who complete an engine swap also swap rear axles, and not necessarily because the original axle is perceived to be too weak. A rear axle swap is often the way to go for anyone who wants a limited slip differential and/or a different (usually higher) gear ratio. However, if the rear axle comes with its own brakes, the braking system may need to be re-evaluated as a whole to assure proper front-to-rear balance.

Additionally, many engine swappers will want to increase tire width and/or diameter. With modern radial tires, and especially with wider contact patches, quicker stopping becomes quite feasible - but modification of the brake system may be necessary to take full advantage of the possibilities. Larger tires and wheels are more effective flywheels. (Even if they don't weigh more than the original wheels and tires, their weight is distributed further from their axis which makes them more effective at storing energy,) At high speed the momentum stored in the rotating wheels becomes significant. It's quite possible that stopping distances will actually increase significantly with up-sized tires and wheels if the brakes aren't also upgraded. Jeff Schlemmer's article "Ultimate $15 Brake Upgrade" describes one clever approach to dealing with this issue... A second and somewhat more conventional approach is to fit "big brakes". Larger diameter rotors can provide significantly more braking torque, whereas vented rotors are able to shed more heat and thus resist "fading" during hard use.

Disclaimer: This page was researched and written by Curtis Jacobson. Views expressed are those of the author, and are provided without warrantee or guarantee. Apply at your own risk. For further information we recommend "Brake Handbook" by Fred Puhn.

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Bonnet Struts: A pair of gas struts can now raise your bonnet effortlessly to an incredible 80 degrees! Struts give full access to the engine compartment, *support the bonnet on both sides,* and keep it level instead of letting it droop on one side. To close the bonnet, just pull it down gently and let the gas struts ease it down onto the catch. It's that easy! (Note: this kit is specifically designed for MGB cars with steel, not aluminum, bonnets.)

Boot Struts: The trunk strut kit lifts the boot lid to the normal height, but with two struts to support it on both sides and keep it level. The really big advantage of gas struts is that there's no danger of damaging the boot lid by closing it before remembering to release a prop-catch. The price of our gas strut kit is less than having a bent boot lid repaired.

GT Hatch Struts: What about MGB-GT hatchbacks? We have a great kit for that too! Press the release button and the hatch rises on its own. To close, just push down. Installation is simple, with only four holes to drill. It only takes 20 to 30 minutes.

Bonnet (Hood) Strut Kit ..... $US 60.00/set
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Add $US 7 for shipping and handling per each kit. (plus $US 2 per kit if paying by PayPal.)
All strut sets come with mounting hardware and illustrated instructions for easy installation.

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#_____qty - Bonnet Strut Kit @ $US 60 + $US 7 shipping/handling (total $US 67)

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PayPal, Personal cheque, or cashier's cheque only at this time!
Please add $2.00 per kit if you are using PayPal.

Photo 1: Jeff Schlemmer Testing His Brakes

The Ultimate $15 MGB Brake Upgrade

as published in British V8 Newsletter, Volume XIV Issue 3, December 2006

by: Jeff Schlemmer, proprietor of Advanced Distributors, LLC

(Editor's note: please make sure you read and fully understand the disclaimer at the end of this article. Brake system performance is absolutely critical to the safe operation of any car. Modifications that suit one owner or application may be very dangerous in a slightly different application.)

I just knew that there must be a way to modify the stock braking system on an MGB to provide better stopping power without having to purchase new calipers and larger rotors. I have 205/50R15 racing compound tires, and they offer plenty of stopping traction. Even with a fresh and complete rebuild, the stock brakes in combination with braided-steel hoses and all new lines just didn't offer the pressure and feel that I wanted. Mind you, I have a Mark II (1971) MGB with non-servo dual line brakes. I don't want the soft feel of power brakes, but I also don't want to have to use both feet to lock them up!

Photo 2 illustrates how I modified an MGB master cylinder bracket (or "brake box") to achieve thirty percent more braking power with the same pedal pressure. You can see the modified brake box on the left. Notice how a plate has been welded to the front surface of the box to relocate the master cylinder 1/2" lower than stock. Welding the plate to this side of the brake box was important. The idea was to lower the mounting of the master cylinder without changing its mounting plane.

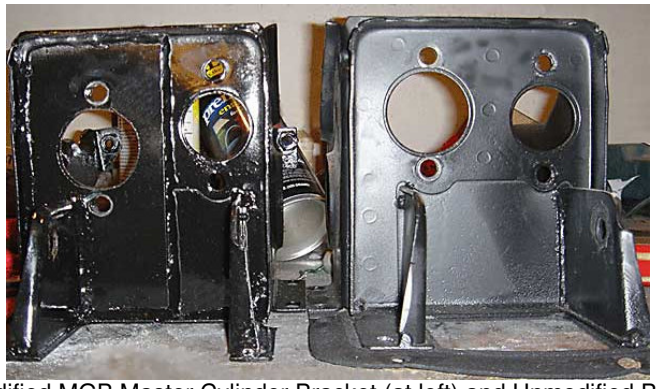


Photo 2: Modified MGB Master Cylinder Bracket (at left) and Unmodified Bracket (at right)

I selected a master cylinder mounting plate from www.speedwaymotors.com (part number 916-41025) for about $15, but you could make your own relatively easily. The plate was made from 3/16" thick cold rolled steel, and came with pre-punched holes for mounting dual brake master cylinders and also one clutch master. I just cut it down and used the portion I needed. The plate actually wraps around both sides of the pedal support (shown projecting toward the viewer). I chose to MIG weld the plate all around its perimeter.

Photo 3: Modified MGB Brake Pedal (at left) and Unmodified Brake Pedal (at right)

Photo 3 illustrates how I modified the pedal. Some material was welded on to allow the same mounting depth for the master cylinder attaching point. Then, a new pushrod attachment hole was drilled at a height calculated to provide pushrod alignment. (Note: if you don't relocate the pushrod attachment hole lower in the pedal, the master cylinder pushrod will be misaligned and will certainly bind. Notice also that the brake light switch was designed to contact the pedal higher than the newly drilled pushrod attachment hole, so you mustn't trim off the top of the pedal. Don't ask why I even bring that up!

The relative position of pushrod attachment is what determines pedal ratio. Measure the distance from the center pivot of the brake pedal to the center of the footpad, and then divide by the distance from the pivot hole to the master cylinder pushrod attachment hole to calculate "pedal ratio." The total effect of this modification was to increase the pedal ratio from the stock ratio of 4.35:1 up to a new ratio of about 6:1. It would be very easy to do locate the master cylinder and attachment hole even lower to produce an even greater ratio, which would result in even easier braking effort. The "feel" of this change could be best described as half way between stock brakes and power brakes. The pedal is much more responsive and lighter in feel, but not soft by any means. Pressure at the calipers is increased from a stock 1227psi to a nice 1644psi. I don't have any issues with wheel lock-up and it performs flawlessly. This could be a do-it-yourself job for nearly anyone with a MIG welder and the knowledge to use it. It can be accomplished for about $15, and it provides the cold stopping power you would expect from a very expensive "big brake" upgrade kit.

Drive fast & take chances!

Disclaimer: This page was researched and written by Jeff Schlemmer. Views expressed are those of the author, and are provided without warrantee or guarantee. Apply at your own risk. Please especially note that this article suggests a deliberate compromise between (longer) brake pedal travel and (increased) braking force as can be accomplished by increasing mechanical advantage in the pedal assembly. Although Jeff reports excellent results in his particular application, this compromise may be ill-advised for your application. For example, you might find an insufficient safety margin of pedal height remains for dealing with a ruptured brake line, heat-related brake "fade", or air trapped in the brake system. There could be other un-foreseen safety problems. For further information we recommend "Brake Systems - OEM and Racing Brake Technology" by Mike Mavrigian and Larry Carleys and "Brake Handbook" by Fred Puhn.

Brakes are critically important safety equipment. If you're uncomfortable working on brake components take the work to a qualified professional.

MGB Power Brake Upgrade: Fitting a Wilwood Master Cylinder

as published in British V8 Newsletter, Volume XIV Issue 3, December 2006

by: Larry Shimp

(Editor's note: please make sure you read and fully understand the disclaimer at the end of this article. Brake system performance is absolutely critical to the safe operation of any car. Modifications that suit one owner or application may be very dangerous in a slightly different application.)

I have Wilwood Dynalite 4 piston calipers in the front and Merkur disk brakes in the rear of my car. I've been running the original MGB power brake master cylinder, but the brakes were always mushy with a long pedal travel. The problem is that the caliper fluid volume is considerably more than that of the original MGB brake system, and the 3/4 inch master cylinder needs a long stroke to displace enough fluid to stop the car. One suggestion is to use Wilwood 2 pound check valves in the brake lines to keep the pads in light contact with the rotors at all times and so decrease the needed piston travel. In my opinion, a better solution is to install a bigger bore master cylinder.

In carrying out an Internet search I found that Wilwood makes a 1 inch bore, dual reservoir master cylinder with the same flange bolt pattern as the MGB cylinder, and it only costs $120 (from Summit, part number WIL-260-7563) which is less than a new MGB master cylinder. If you decide to change your master cylinder, make sure to first read the instructions that come with it and be sure to follow all the manufacturer's instructions and recommendations.

I got the Wilwood master cylinder and confirmed that the push-rod end of the housing fit the ID of the power booster perfectly. If it were too small there would be a vacuum leak, and if it were too big the master cylinder couldn't be installed. I assembled the master cylinder with a bit of silicon sealer in the contact area to assure a vacuum-tight seal. The distance from the flange face to the brake piston was identical to that of the MGB cylinder, and the total brake stroke was also identical, so the brake pushrod needed no modifications. All that was necessary to fit the new master cylinder was to turn the booster 90 degrees because the Wilwood cylinder has a vertical mounting flange whereas the MGB cylinder has a horizontal flange.

Removing the booster mounting nuts to rotate the booster can be difficult. The most trouble is with the nut at the lower right by the brake pedal. This is best removed from under the dashboard using a socket and 1/4 inch ratchet. Due to limited clearance, the wrench can only ratchet one click at a time, and only if a high quality ratchet driver is used that has minimal free play and fine ratchet teeth, I used a Sears Craftsman driver, but a cheaper one I tried first would not work. (Editor's note: from what I've seen, Sears 3/8" ratchets come with either 24, 36, or 45-tooth mechanisms. My favorite ratchet is Sears' simple, classic 45-tooth non-quick release "banjo-style" ratchet. However, I've seen other brands with as many as 72 teeth...) The same socket and driver works very well on the left lower mounting nut. For the upper mounting nuts, an open end or 12-point box end wrench works. (A 6-point box wrench is not satisfactory.) The good news is that the pedal box does not have to be removed.

To connect the two front brake lines, I used a "T" fitting (like the kind normally found at the rear-axle), screwed into the master cylinder using a threaded (Earl's brand) adapter from Summit.

The threads in the T-fitting and master cylinder are 3/8" 24 thread-per-inch, and this corresponds to an AN #3 (military spec) fitting. It is important that the ends of the AN fitting be ground down so that they do not contact any of the internal seats in the T or master cylinder; sealing is by the copper washers used on the MGB brake hose that normally goes on the T. Buy at least 3 new copper washers to allow proper rotational indexing of the T fitting. The adapter must be steel for strength. It is possible to buy a brass compression union at a hardware store that will fit, but this is too weak and is potentially dangerous!

As an alternative to the T fitting, the pressure differential switch from a non-power MGB dual brake system can be used, but these are somewhat scarce and new ones cost over $300. If using the MGB switch/adapter, make sure it does not have an internal leak. This leak will show up as fluid loss through the pressure differential switch. The external leak can be fixed by replacing the switch

with a bolt and washer, but the internal leak between the front and rear brake circuits will remain and will defeat the safety advantage of the dual master cylinder. Rebuild kits for these are available, and this is the proper way to fix it.

The brake line compression nuts that go into the old master cylinder will not fit the T or the new master cylinder. As was explained above, all the new nuts need to be 3/8" 24 thread-per-inch. These are readily available at any auto parts store by buying a short length of brake tubing with the appropriate fittings. Take along the T-fitting to be sure of the size. You can also use spare MGB tube nuts, but many of these are not threaded all the way to the end, and fully threaded fittings are needed for the T and master cylinder. The lines that go in the T have to have a double flare. (Buy a double flare tool to do it right.) A double flare also works for the master cylinder.

It is important to connect the front brakes to the rear fitting on the master cylinder. The rear chamber is the primary chamber, with the piston connected directly to the brake push-rod. The front chamber is actuated by the fluid in the rear chamber, or, in the case of a leak, by the rear piston pushing on the front piston. Note: before connecting the lines, be sure to remove the check valves from the master cylinder following the instructions that come with it.

In my view, the only installation deficiency is that I was not able to fit the pushrod seal. The seal is designed to prevent vacuum in the booster from sucking the fluid out of the master cylinder in the case of a piston seal leak. But leaving the pushrod seal off was acceptable to me because it is only a back-up system. In any case, the front fluid reservoir would not be affected. However, this is only my opinion. If you have any doubts, do not make this conversion.

Bleeding the Wilwood master cylinder is extremely easy because they provide bleed valves right on the master cylinder body (as shown in the photo); one for each brake chamber.

The conversion was not difficult and it made a huge improvement in brake feel. The pedal stroke is shortened by about 60 percent, and the pedal is now firm.

Note: in the picture, my brake lines appear to be copper, but they are not. These are the British brake lines that contain some copper in their alloy for corrosion resistance. Copper lines should never be used because they will become brittle over time and can break!

Disclaimer: This page was researched and written by Larry Shimp. Views expressed are those of the author, and are provided without warrantee or guarantee. Apply at your own risk. Please especially note that this article suggests a deliberate compromise between (shorter, firmer) brake pedal travel and (possibly reduced maximum) braking force as can be accomplished by increasing piston diameter in the master cylinder. Although Larry reports excellent results in his particular application, this compromise may be ill-advised for your application. For example in the event of a failure in the power brake booster, you might find that the amount of pedal effort required to stop the car is higher than you expected. (Incidentally, Larry has tested this on his car. Your car may be different.) There could be other un-foreseen safety problems. For further information we recommend "Brake Systems - OEM and Racing Brake Technology" by Mike Mavrigian and Larry Carleys and "Brake Handbook" by Fred Puhn.

Brakes are critically important safety equipment. If you're uncomfortable working on brake components take the work to a qualified professional.

Hoyle IRS Suspension Mods: New Anti-Sway Bar and Stronger Axles

as published in British V8 Newsletter, Volume XIV Issue 3, December 2006

by: Larry Shimp

(Editor's note: this article provides follow-up information to Larry's previous article "Hoyle Suspension Upgrades for the MGB" which appears in British V8 Newsletter, Volume 13 Issue 1, January 2005.)

Since the British V8 meet in June, I've replaced the axle shafts with stronger, custom made items. This was required because I broke one of the original shafts and twisted the other... I also found a way to install an MG Midget rear sway bar to the Hoyle suspension. (See photos below.) I've discovered I can fit 16 x 7 wheels with 215 width tires, with no fender flares. This is an advantage of setting 2 degrees of negative rear camber! However, the wheels and tires will have to wait until later.

Rear Sway Bar:

I like the Hoyle Engineering independent rear suspension, but like the stock MGB-GT rear suspension, it doesn't come with any provision for an anti-sway bar.

Body lean on corners isn't desirable because: 1) as a car leans, the suspension geometry changes unfavorably, 2) weight is transferred to the outside tires, reducing the load on the inside tires and thus the total available traction, and 3) responsiveness is reduced because the car does not take a stable line until it has finished leaning.

Body lean can be reduced by fitting stiffer springs, or sway bars, or both. In general, sway bars are a better alternative to stiffer springs because real world road surfaces aren't ideal. With stiff springs, the wheels are more likely to bounce over the road surface, and when the wheels are not on the ground, they are not guiding the car. Soft springs with good damper control usually work well as far as maintaining tire contact, but then body lean becomes a problem. This is where sway bars can help. They have minimal effect on bump response, but can be very effective in keeping lean under control.

Most MGBs are fitted with a front bar only. (Note: early roadsters came from the factory with a 9/16" front bar only. All GTs came from the factory with a 5/8" front bar only. For a couple years after converting to rubber bumpers, MG failed to fit any anti-sway bars at all to the roadsters... but that was madness. After they came to their senses, MG fit both front and rear bars on roadsters until the end of production.) To reduce sway, the stock anti-sway bars have often been upgraded by owners to a 3/4" or 7/8" bar. This is effective in keeping the body more level, but the extra roll resistance is transferred to the outside front wheel. This can overload the tire, and cause understeer. In extreme cases, cornering grip will be little better than when no sway bar is fitted, although the reduced lean will still make the car feel more responsive.

However, better suspension geometry also increases the effectiveness of wider tires, and better tires certainly increase cornering grip. For example, we have all seen pictures of old street/race cars where the inside front tire is off the ground on a hard corner (extra chassis stiffness from a roll cage also helps). For better balance, adding a rear bar is a good idea. A rear bar transfers some of the roll resistance to the outside rear wheel which reduces the load on the outside front tire, thus increasing the front grip and reducing understeer. In the rear, the inner tire will lose some loading, and wheel spin becomes more likely in a car without a limited slip differential. However, if the roll resistance is chosen properly, the compromise between weight transfer, suspension geometry, and roll resistance transfer will result in a higher cornering grip, and a more neutral feel.

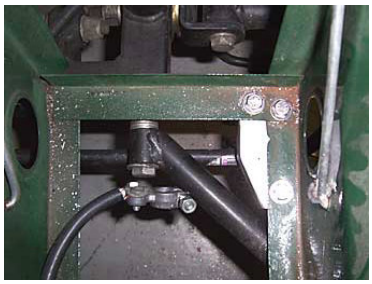
A general rule is that the rear bar should be weaker than the front bar. This helps to make the car understeer at the limit, which is much more controllable than oversteer at the limit. (Remember the reputation early Porsche 911s had?) With a more evenly balanced car like an MGB, it is quite easy to overdo the rear sway bar and induce dangerous oversteer. (Maybe with a 4 cylinder car this can be fun, but with the power and acceleration of a V8 MGB it becomes a handful!)

My MGB was previously fitted with a 7/8" front anti-sway bar, and I decided to fit a rear bar to help balance it. The Hoyle suspension did not come with any provision for a rear bar, so I started looking for something that I could adapt.

Because the MGB is very narrow by contemporary standards, there are few bars that could fit. I confined my search to similar narrow cars and decided that a Midget/Sprite front bar would probably fit. So I went ahead and ordered the complete set of parts including links and brackets. Upon arrival, a test fit showed that this bar would indeed package neatly. I continued with the installation.

To begin, I cut the brackets attaching the links to the Midget front A-arms to a different shape and welded them to the lower front sections of the rear A-arms just outside of the exhaust. I cut the links and welded them back together so the two fittings were at 90 degrees to each other. Then I made spacers from 1 inch thick aluminum plate to attach the bar to the bottom of the battery boxes. That was all there was to it.

Aluminum spacers...



...go under the battery boxes to hold the sway bar brackets.

MG Midget attachment links were cut and re-welded. The welding must be done carefully (quickly) to avoid melting the rubber!

They worked... but I decided to replace them with adjustable links. Advantage: increased stiffness from eliminating the rubber ends.

1/2 inch ID spacers (bought locally and cut to length). The Heim joints are from www.pegasusautoracing.com

The Heim joints facilitate side-to-side adjustment. There is actually more clearance here than it appears!

The rear sway bar made a noticeable improvement: the steering is more responsive, cornering grip seems higher and is very neutral in feel, and the car is more stable at all speeds. It was also very evident that traction was greatly improved in low speed, second gear corners. Overall, the sway bar has increased the overall level of confidence in the car. This was a very worthwhile project.

I have a limited slip differential which is usually recommended with a rear sway bar. However, I suspect that even with an open differential there would be very significant improvements; with the possible exception of the low speed second gear corners.

The 1/2" MG Midget rear bar seems a good compliment to my 7/8" front sway bar. A 3/4" Midget bar is available, but it will not fit due to it having longer arms than the 1/2" bar. The effectiveness of an anti-sway bar isn't simply a function of its thickness. The stiffness of its mounting and the mechanical advantage of the lever-arms that act on it also factor in. The short arms of the 1/2" MG Midget bar mean that it provides more roll resistance than a 9/16" MGB front bar.

Axle Shafts:

There is also bad news. I broke one rear axle shaft and twisted the other! The Hoyle suspension uses shortened Merkur/Scorpio

axles. To shorten them, a section of larger diameter tubing has been fitted as a "splice" in the center of each shaft and it's welded at either end. Diameter changes and welds create stress risers, so perhaps it should be no surprise that this is where the shafts broke. I ordered custom replacement shafts from Dutchman Motor Sports in Portland, Oregon. These are of a constant diameter and are made of high grade chrome-vanadium steel. For what they cost I expect them to last forever.

Fatigue failure: broken axle shaft.

The other axle shaft had cracked too.

Better design: unspliced axle shafts.

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Car Dolly Project

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by: Greg Myer

I recently built a car dolly so I could access my car's every part. The suspension can be removed and replaced. Welding can be done anywhere on the car without worry about hot slag hitting the tires or freshly painted cross member. I should have built one long ago.

If you weld and are contemplating restoring a car or truck it just may be the first step you should consider. The car is easily moved to any corner of the shop when on a dolly or even outside by one person. If your car's not going to be finished in a few weekends, quite often you'll need the space, however briefly, where your car is sitting. (Sort of a Murphy's Law kind of thing!)

I have seen many car dollies. No two seem to be the same. Some are quite small and mount via bolts to specific pickup points on the car it was built to hold. Others are large. Some are adjustable. The small ones in width and length that hold a car several feet off the floor look tippy to me. If you pushed your car over a misplaced wrench or a stone that had inadvertently been kicked into the shop they look like they could fall over. I've never seen it happen, I've never heard of it happening, but I made mine longer and wider anyway. In fact I made it large enough to handle whatever project I may tackle in the future. I have several more LBC's waiting patiently for their turn and I've been known to get involved with street rods and classic pickups from time to time. I could even put a full size pickup or van on it if needed.

I made it adjustable so I can use it for a wide variety of possibilities. I had some 4" angle iron out back left over from some project so I used that. I made the length 8 feet - that will pick up the rear and front frame rails on most anything I will be working on. At 4 feet wide it will be stable with a lot of weight or not.

I welded the end pieces on top of the side rails as I plan to put other pieces of angle iron inside and they need to be even for the jack stands. That's what I use. Brackets that bolt to a car could be fabricated also.

The spare rails slide up and back and with a piece of 2 x10 laid across them make a solid base for the jack stands. The stands can then be run up as high as needed or left low. If they are all the same and hit the frame, your car should be level. If that is important

for what you are doing; measure from the floor just to be sure. If not, you can support the car on its differential or front crossmember, depending on what you're working on.

I purchased a set of Government surplus casters from eBay. The wheels and tires (solid rubber) are 8 inches in diameter. The mounting point at the dolly puts it 10" from the ground. Big casters! I chose them so I could get my large floor jack under the dolly. Sometimes that's needed to position the engine/transmission combo, or raise the front crossmember into place. The legs of my engine crane also clear easily. These casters were welded to the rails at the corners, but they could just as easily have been bolted. In fact, now that I think about it, the whole thing could be bolted together. Welding is easier than drilling all those holes, but build yours any way you like. These casters have Zerk fittings so the bearings can be greased. If I need more space in the shop I can store the dolly outside without worry.

This is not a set of plans, but rather an idea to stimulate you to think about what you might need and have laying around that could be put to good use. If you are new to welding, it's a great beginner's project as the appearances of the welds are not important, as long as they hold. Have fun!

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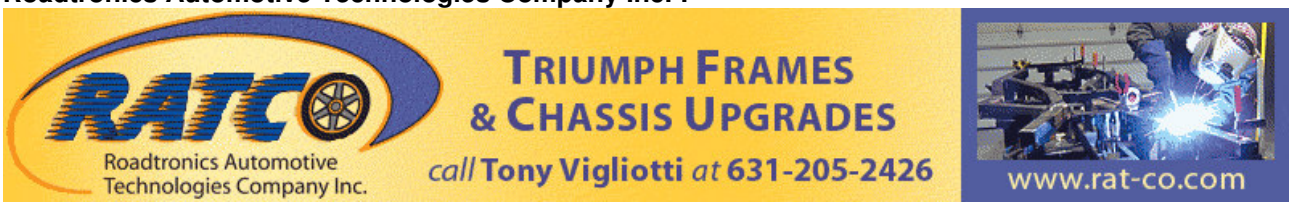

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