



## Restoration — This article is mainly about British Cars

You are thinking about restoring a \_\_\_\_\_. Come with me, have a nice cup of relaxing tea (maybe some crumpets as well), and let's talk cars.

First and foremost, you must decide what you are doing to use this vehicle for, and what you expect of it.

From where I sit, there are three distinct paths you can follow when restoring your car.

My dictionary defines "restore" as:

- To bring into existence or use.
- To bring back to original condition.

To modernize for use on today's roads, and traffic conditions. (I take poetic license on this one.)

So...., what's it going to be? Number one, to bring the vehicle back to functionality. Let's explore this option further. This would be applicable to a car that would immediately bring financial ruin, if you were to pursue definition number two. However, this rule can be overridden when the emotional attachment to the vehicle is so strong that all financial restraints go out the window.

Making vehicle functional means that it is SAFE! That includes brakes, steering, suspension, lights, wipers, tires, wheels and seat belts that function properly and are not dry rotten, and a car that does not stop running when you are crossing three lanes of oncoming traffic!

Restoration number one would apply to a car that has a cosmetic appearance that is acceptable to its owner and is structurally sound, but is too rusty to restore to number two condition.

Restoration, definition number two. Humm...., this level of restoration would be appropriate on a vehicle that one: has over \$25,000 of value, or two: has a minimal value of \$5000, but is just plain fun, you love it, and you plan to keep it for awhile.

Then there is the term "over restored." This means that the owner has made the fit and finish better than it was when it was originally manufactured. This is something that must be carefully discussed with the prospective customer or with yourself. Generally, cars in condition number two will bring premium price when sold. If, and only if, the caliber of workmanship is superior. The "over restored" car may have more or less value than a "correctly" restored vehicle (depending on the vehicle) the prospective purchaser's perspective.

This leaves us with number three: to modernize for use on today's roads and traffic conditions. (This is my personal favorite.)

I work on cars from the 1950's to today's latest models. Most cars from the 1950's perform incredibly poorly when compared to the modern econobox. Modern cars almost always start, run flawlessly, stop on a dime, and handle amazingly well compared to almost all of their primitive brethren.

If you plan to drive a classic or collector car with frequency and regularity, several parameters must be considered and evaluated in order for the proper course of action to be determined. If not, driving one of these "old" cars in modern traffic and on modern roadways can cause significant mental and physical distress.

I try, in my shop, to follow the golden rule of mechanics: "do no harm!" my interpretation of this rule is not do anything in the process of repairing, maintaining or modifying a vehicle that requires cutting or welding to the structure without significant amounts of consideration. In fact, I rarely do this. "Modernizing", to me, means: updating wheels, tires, suspension, internal engine, components, fuel, ignition, charging, lighting, exhaust and air filtration systems, in whatever area the particular car needs remedial help. That way it can be driven more comfortably, maintained more easily, perform better, and be more reliable for its owner.

All cars have their strong and weak points. It is up to the owner (with competent knowledge and professional help, if required) to determine which parts of the vehicle should be updated. I try to do all my "modernizing" using components from the same car line. For example, installing an MGB engine in an MGA, installing a Jaguar power steering rack from an XJ6 into a Jaguar Mark II, which originally had a steering box. I used mounting fixtures I designed and fabricated over twenty years ago.

Upgrading wheel and tires is the simplest way to improve the handling, braking, and accelerating capabilities of an older car. Once again, this must be done with careful thought and planning. Ask yourself, is it period appropriate? Will they fit into the wheel wells? Is the suspension system up to the increased load the modern tires and wheels will provide? Correct tire pressures are critical for the proper performance of any car. This can be accomplished in a variety of ways. One: start with the factory recommended pressures, "chalking the tires", is a time tested, and very workable technique for anybody to use. A more sophisticated technique is to use a pyrometer. Specific information on either of these techniques is readily available from a variety of sources. I have been fitting modern wheels and tires to older cars for 25 years with great results.

Let's visit about wire wheels. First off, wire wheels look great on British cars. The facts are; they are heavy, (which impedes performance) they are time consuming to clean, they require maintenance; mounting splines wear out, most require tubes, and many shops cannot balance them properly. Having said that, if you like the way they look, and are willing to deal with the negatives, go for it!

A few points to consider when replacing wire wheels; is, there is a choice in the number of spokes available go for the larger number- they are stronger. If the hubs have not been replaced, do so with the wheels. Chrome wire wheels cost about \$100 more per wheel, and offer ease of cleaning, they are longer lasting, and are worth rebuilding, unlike the painted version.

I fit Panasports (which are a copy of period correct Minilites) to many of my restorations. They are light, less expensive, low maintenance, and they look great!

Upgrading the suspension system can include from the simplest modern, high quality shock absorbers, to more complex replacement of a steering box with a rack and pinion setup. It is reasonably well known that the TR4 through early TR6's break front suspension anchoring points and the big Healey's break engine mount stands. It makes sense to reinforce these area when the engine is out for repairs.

Making sure a TR4A-TR-6 rear suspension works properly and last longer often requires the use of modern suspension bushing material, updating springs, and correct alignment settings. By correct alignment setting I mean determining what the car will be used for and how aggressively it will be driven. I ASSUME radial tires will be fitted.

Updating internal engine components is done for several reasons; more power, more durability, and more smoothness. In my opinion, it would be foolish NOT to take advantage of the technological leaps that have occurred in the last \_\_\_\_\_ years since your car was originally manufactured.

Fuel injection systems are updated/upgraded for the same reasons as internal engine components. It is also important to factor in the ease of maintenance, and in the case of electronic ignition vs. points, no maintenance, little or no degradation of "tune-ups". As points wear, the gap decreases, the dwell time decreases, the timing retards, and the ignition systems potential maximum voltage output diminishes, performance degrades, and then it is time for a "tune-up".

Caution is the watchword. There are some wonderful after-market electronic ignitions and there are some crappy ones out there. When you increase an ignition system's voltage capacity (read high output) you stress the dielectric (read insulative) qualities of the distributor cap, rotor, spark plug wires, and spark plugs. Any vehicle (TR6's come to mind) with smaller diameter (read closely spaced) distributor cap terminals have the potential for arcing which causes misfiring. This can be cured several ways. One way is to drill two small holes in the distributor cap which help; prevent the air inside from ionizing, (becoming a conductor) and smelling like a lightning storm (which is essentially what happens inside the distributor cap). But, I digress.

Anyway, I feel that all cars with points should have electronic ignition systems retrofitted if they are going to be driven regularly. I have heard the argument (and used it myself) that points can be fixed anytime, anywhere with a Swiss Army knife, (which, I have done myself) and electronics can not. To that I say- fine. Carry a spare breaker plate (the part of the distributor that the points screw down to) with points setup, ready to go, and if the electronics fail, pop in a breaker plate, and a way you go. So far all my customers that I have supplied with a spare breaker plate, have not used it. As to the issue, "they do not make one to fit my car", Pertronix will custom make (and has made many for my shop) a setup to fit most cars if an "off the shelf" kit is not available. WOW! Time to get off my soapbox about the electronic ignition retrofit issue.

Next up is the charging system- positive verses negative ground, and the alternator versus generator controversy.

Again, care consideration is the key. I always recommend conversion to negative ground for the MAIN reason that any electrical or electronic component can be used in your vehicle. Secondly, if your car ever requires a jump or you need to jump another car, it's easy! Instructions are readily available from a variety of places for positive to negative ground conversion.

Now on to the generator/alternator controversy. Basically, this is how I counsel my customers; if you are NOT going to add additional electrical components, i.e.; Quartz headlamps, electric main or auxiliary for most use, then keeping your original generator will be okay. The other consideration is that it is getting harder and harder to find people who can still repair, and test generators, and the voltage regulators that go along with them.

The wonderful fellow that used to repair all of ours, passed away several years ago. (A moment of silence) By the way, if a more modern charging system is available from a later version of a car (for example, a MGB alternator and bracketry can be readily fitted to a MGA) we use it. When we come across a car where there was never a "factory available", we fabricate a proper bracket that simply looks factory. We put a lot of work in Land Rovers, and when people add huge amount of auxiliary lights and a winch, an alternator is mandatory. We stock our own custom made bracket for this application.

Lighting is another area that in older cars require modernization, if you are going to drive them any distance at night. Bolt in quartz iodide headlamps to fit most old cars are readily available. The only caveat is you may need to install a supplementary wiring harness and relay system to make the lights effective and not damage the original (undersized for this application) wiring.

I am especially picky about exhaust systems. I do not like noisy cars yet I do not like totally silent cars either. The sound volume needs to be "just right". The cross sectional area (diameter of pipe used) needs to be

adequate for the volume of air pumped out of the engine.

Exhaust headers are another touchy subject with me. They can offer a performance improvement over a restrictive factory designed exhaust manifold. For example, on MGA's fitted with an MGB engine, there are three alternatives. One, use an MGA single down pipe factory exhaust manifold. This solution looks original, but performs poorly. (I have never done this). Two, cobble up a B exhaust manifold or clear the steering shaft. This looks nasty, and also performs poorly. Three, use a quality header. If a header is cheap, it's probably junk. Find and buy a good one for your application. Look for thick mounting flanges and beautiful welding to start. If a header is of poor quality, it will leak, rust out, and be a constant source of headache. I always coat headers (after checking fit) with an aluminized ceramic coating. I use Jet Hot Coatings. We get at least ten years out of this process. The headers do not rust out, and it looks great.

If a catalyst is required, primarily 1975 and later cars in our emissions regulated area; **IT MUST NOT BE IN THE ENGINE COMPARTMENT!** (i.e. MGB, MG Midget, and Triumph Spitfire come to mind immediately).

A properly, professionally installed catalyst should be mounted under the car to move that 1000 degree source of heat out of the engine bay! What do you think 1000 plus degree does under-hood temperatures, hoses, fuel boiling, ect., ect/, ect. What were you they thinking?

Fuel systems are something else I wish to touch on. First, fuel delivery. I have found original SU "Kerplockita" pumps to be very reliable. The after-market plastic reproductions are junk. I am trying the new updated electronic (read no points) SU pump in our latest MG projects, we have had no failures yet.

Moving on to carburetors- let's discuss SU's first. For an older car to run properly the carb(s) must be properly rebuilt, including new or refurbished throttle shafts. Joe Curto has been doing our rebuilds very satisfactorily for twenty years. Roy Mathews make available thermally compensated jets for SU's up to one and three quarter inches, (if my memory serves me correctly). This corrects most, if not all, heat-related drivability problems.