



### Improving your MG RV8

Recently Roger Moran had some 'under the bonnet' changes made to his RV8 which have resulted in improved performance and lower fuel consumption. In addition, the engine now runs even more smoothly, and, in Roger's opinion, results in a greater enjoyment of the car. Here Roger explains why and how the changes were made.

Before the changes were made I heard that they would both improve performance and lower fuel consumption. Naturally I was inquisitive! Well in brief – they do!

Although I have only owned my RV8 since the beginning of June this year, the car had been returning around 25mpg in mixed driving conditions. When I filled my car up after the changes were made my consumption was 33mpg – following a long run. Another Club member with an RV8 mentioned he is getting an average of 31 to 32mpg. Naturally, it depends on various factors: how you drive, town driving or long runs and of course speed.

#### What are the changes?

The 8 **Lucas fuel injectors are replaced by Bosch injectors** and a **new engine management chip** replaces the factory fitted chip. Although my car has been well looked after and professionally stored with a low mileage (21,000 miles for a 21 year old car), I was also advised to change the spark plugs, so I had **NGK B7ECS plugs fitted**. The mechanics tested the car on a rolling road before and after the changes were made and a graph printout showed the difference. The changes have resulted in a higher power output and smoother power curve indicating that the engine is now pushing out well over 200 bhp. The changes take approximately four and a half to five hours.

#### Background of the Rover V8

As you may know, the standard engine management software is taken from the North American Specification (NAS) Land Rover Defender. This was necessary for MG

when the car was produced, because in that way they were able to use an engine that had already met all the relevant emission standards. Even for a sportscar manufacturer, exhaust emission is the first priority that must be met when mapping the standard engine. This inevitably involves various compromises to be made over the ideal settings for economy or power. Manufacturer's emission tests are very much more stringent than the MOT test, and include the warm-up cycle which is where most of the problem emissions occur.

Emissions compliance requires a very flat air/fuel mixture, which is neither ideal for economy or for power. The compromises in the fuelling also require very conservative ignition timing. Once the fuelling issues are addressed then more adventurous ignition timing may be used.

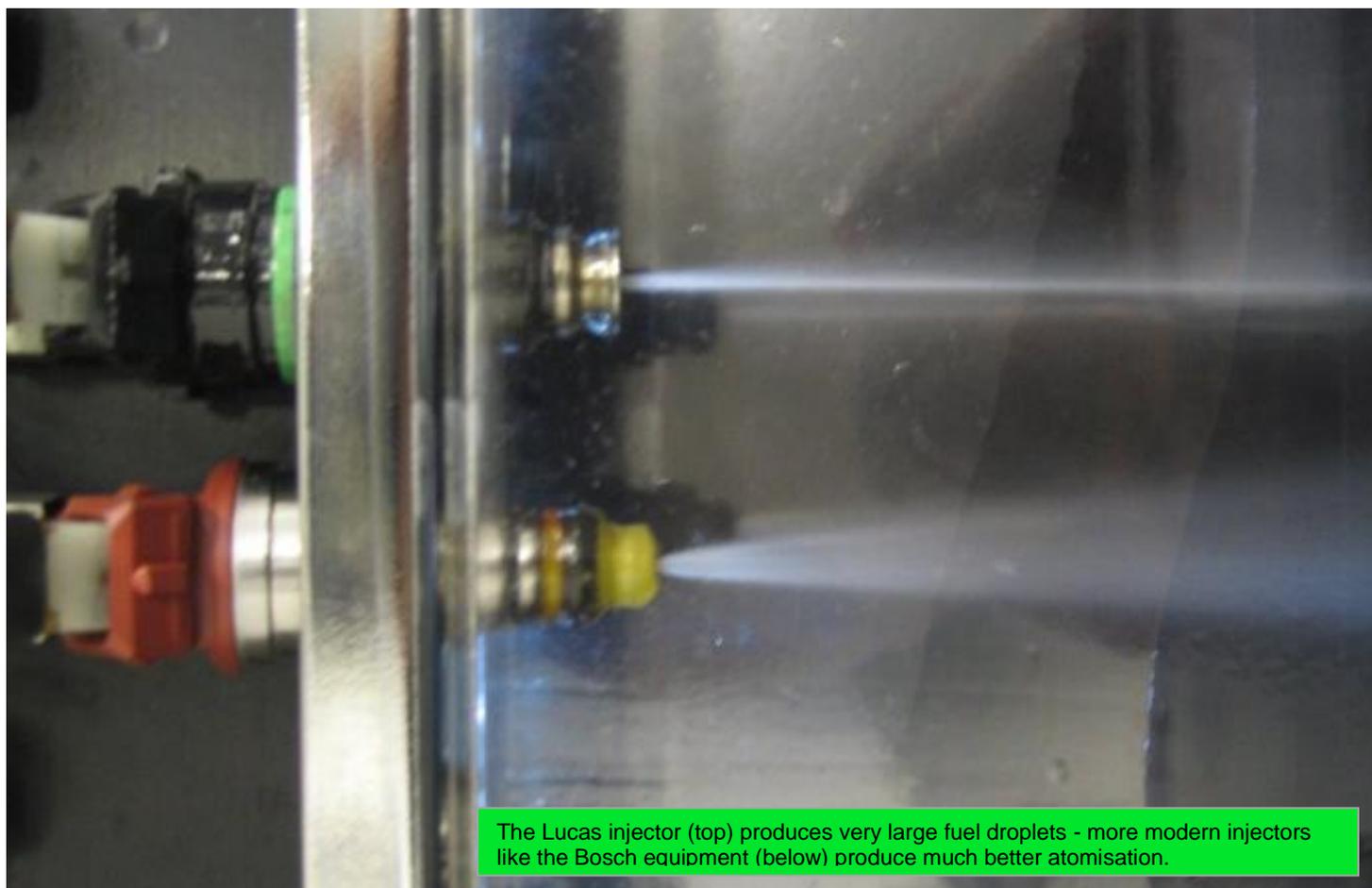
Such characteristics are not unique to any fuel injection system or vehicle manufacturer. This behaviour is displayed by most modern cars which have to comply with very tough exhaust emission legislation as the first priority. Emission standards for manufacturers are so demanding that they need to use every trick in the book to ensure compliance.

It is possible to achieve a 10 to 15 bhp power increases with 10-15% economy improvements once these compromises are removed and the engine will rev much more smoothly and eagerly.

Many other operating characteristics are addressed by this upgrade. These include idle speed, idle stability, cold starting, crank fuelling, rev limit, etc. Therefore this is a thorough treatment of the entire set of operating characteristics that goes far beyond ignition or fuelling adjustments. The standard fuel map only goes up to 5,500 rpm which is fine for a standard Land Rover Discovery or Range Rover, but is not best suited to the more sporting variants. Where appropriate the map is extended to 6,000-6,500 rpm as determined by the application.

As you would expect, the upgrades are fully compatible with the standard vehicle diagnostic and security systems. Service and fault diagnosis procedures are unaltered, and the upgrade is undetectable to diagnostic and test equipment.

The Lucas petrol injector is a rather dated design, originated in the early 1980s. They tend to suffer from poor fuel spray pattern and atomisation problems. Basically fuel droplets burn from the outside in, so the smaller they are the quicker they burn. The Lucas injector produces very large fuel droplets, and more modern injectors produce much better atomisation.



The Lucas injector (top) produces very large fuel droplets - more modern injectors like the Bosch equipment (below) produce much better atomisation.

If your budget permits, it is a great idea to **replace the injectors with a modern Bosch design** as used on the Thor engines. The new design offers 5-8 lb/ft of torque, 3-5% improved economy, and smoother running over a perfect set of Lucas injectors. A perfect set of Lucas injectors is quite rare! Also you could use the ACT Super Flare Carbon Fibre trumpets with a standard inlet: For information see the [ACT website](#): These give another 8-9 lb/ft of torque everywhere, and allow the engine to rev more freely. They are considered to be "highly-recommended", and are easy to fit whilst changing the injectors.

**Magnecor plug leads** are also recommended, with hundreds fitted over the years, which can be ideally combined with a high-quality spark plug such as the Denso Iridium Tough VK22, or the NGK Laser Platinum PFR7B.

#### Where can you get these upgrades?

Mark Adams arranged for my car to be fitted at Rolling Road in Cheltenham – contacts alongside - however the upgrades can be fitted elsewhere.

Some members may consider the total cost too high. However, considering how the

changes have improved the car – notably the smoothness of the engine, improved power yielding significantly lower fuel consumption – I am delighted that my RV8 is now an even greater pleasure to drive. If you are interested, then do contact Mark Adams.

Finally I should add that I have no connection with Mark Adams, Tornado Systems, Rolling Road, ACT or Magnecor.

#### What did these improvements cost?

Tornado Systems		£
14 CUX ROW Tornado Software, including		350
Media Kit, 3.9 litre extended rev range		
Bosch injectors - 185cc/min		400
NGK Competition Spark Plugs (B7ECS)		28
Service consultancy		300
Mechanical repairs and work	5 hrs	375
VAT @ 20%		285
Total		1,738

See our information gateway on **rechipping an RV8** which gathers links to the useful information available on the V8 website:

[http://www.v8register.net/subpages/gateway\\_rechipping1.htm](http://www.v8register.net/subpages/gateway_rechipping1.htm)

#### Contacts

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