WISDOM & WOE FROM THE WORKSHOP

Hello and welcome to the first of a regular technical column for Sprint magazine - written by myself and Nathan Lloyd, from Lloyd Specialist Developments Ltd. This column will attempt to provide useful insights and observations from our TVR-related workshop experiences to help TVR owners maintain, repair or improve their pride and joy.

As many owners of TVR Chimaeras or Griffiths will know, spark plug extenders are primarily used to create distance between the exhaust manifolds and the vulnerable HT leads. Unfortunately these same plug extenders are also prone to causing intermittent ignition misfires. If the problem gets worse over a fairly long period of time, these misfires can even go undetected by the owner.

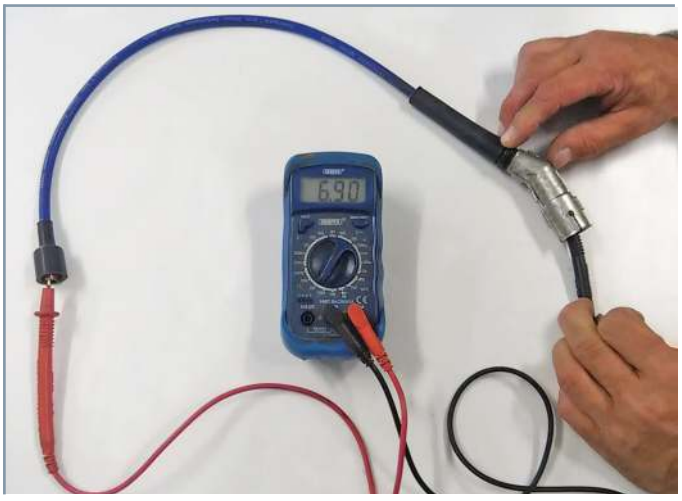
We recently had a TVR Car Club RO bring his car to us for a basic health check and a power run on our chassis dyno, only to find it down on power and noticeably misfiring at around 4000rpm. We removed the spark plug extenders and found 3 of them to be faulty. Replacing these intermittent faulty extenders gained 20bhp at the hubs. A quick tweak of the ignition timing on the dynamometer gained us a further 16bhp at the hubs, netting a very worthwhile and cheap power increase! It is worth noting that these micro-misfires will also increase fuel consumption and affect the general driveability of the car.

Without the aid of a chassis or engine dynamometer, it can be difficult to identify intermittent misfires caused by faulty spark plug extenders. These micro-misfires often only show up with the engine under load. However if you do suspect that you have one or more faulty spark plug extenders then there are still a couple of checks that can be carried out.

Note - Caution when working with ignition systems. The voltage in a vehicle ignition system is typically 15 to 20 thousand volts for distributor set-ups and up to 40 thousand volts with modern distributor-less engine management systems.

Firstly, a continuity or resistance check with a multi-meter will rule out an electrical break. It is worth checking your HT lead at the same time. The combined resistance of the ignition lead and plug extender should be no more than 4000 ohms (4k) per 30cm of ignition lead and ideally no less than 200 ohms (0.2k)per 30cm.

The next check involves running your car in the dark with the bonnet open. Visually check for small electrical arcs *(blue or yellow in colour)* around the spark plug extenders, usually between the extender and cylinder head. The presence of arcing indicates that the insulation in the extender has cracked. A fine mist of water also may be useful if the faulty plug extender is particularly difficult to detect.



Unfortunately it is not always a simple case of purchasing new extenders, as even OE branded extenders do not seem to be as reliable as the originals once were. We have been finding new branded items that still cause micro-misfires.

So can we not simply remove those pesky spark plug extenders? Well, it is possible to remove the extenders from cylinders 1, 2, 3 and 4 without noticeably reducing the life of the corresponding HT leads but this still leaves the last few extenders. One increasingly common method is to remove all of the extenders and fit high-temperature heat socks over the HT leads at the spark plugs. The only problem with this is that the heat-socks on the rear-most cylinders will usually then be in contact with the exhaust manifolds and not even the best heat socks are able to tolerate that for long! Even though the heat sock doesn't necessarily burn, it still conducts heat through to the HT lead.

Better quality HT leads with industrial oven cable insulation will improve the longevity slightly, but the problem will ultimately remain.

Thanks to a customer of ours we recently came across a solution that, whilst not the cheapest, does solve the problem and allow successful elimination of the plug extenders. We made a set of custom HT leads with ceramic plug ends using the Accel 9002C HT lead kits; they provide the maximum distance between the HT lead plug end and the exhaust manifold or cylinder head. At the same time the ceramic plug end has a far higher temperature resistance *(1093 C)* than with any conventional HT lead. The HT lead itself is rated at 315 C and this set-up typically has 500 ohms of resistance per 30cm.

Whilst we are on the subject of ignition systems it seems a good place to talk about spark plugs; our recommendations and what they mean for you and your TVR.

For most naturally-aspirated Rover V8 engines we recommend NGK BPR6ES spark plugs, we have been using these for many years. The 'P' denotes that the spark plug has a projected electrode; this type of electrode is less prone to fouling with rich mixtures and helps to promote a more efficient burn by placing the plug tip closer to the centre of the cylinder. The 'R' denotes that the spark plug is resistive, this is a requirement for most electronic fuel injection systems. The '6' is the heat grade - the higher the number, the cooler the plug runs. We generally only use a BPR7ES for heavily tuned engines. We reserve the BPR8ES for engines with forced induction or particularly high compression ratios *(higher than 10.5:1)*. It is also worth noting that you can use the more expensive iridium versions of these spark plugs instead *(eg: BPR6EIX)* - these plugs last longer than the standard type but this needs to be weighed against the additional cost.

When fitting new spark plugs it is always worth checking that the spark plug gap is set correctly. We usually set them to 0.8-0.9mm. Although they are often set correctly from the factory, all it takes is for someone to drop one and you could end up with a bad misfire. It is well worth a simple visual check during fitment. With forced induction applications it is sometimes necessary to reduce the spark plug gap. This is because the higher cylinder pressures of a boosted engine require considerably more energy to get a spark across the plug gap. If you think that you are getting this problem on your supercharged or turbocharged TVR, then we recommend reducing the gap by 0.1mm at a time to a minimum of 0.6mm. These misfires are usually noticed at peak torque when the cylinder pressures are at their peak.

We hope that you found this article interesting and useful. If you have any particular questions that you would like us to answer then either write to Sprint magazine at editor@tvrcc.com or contact us at enquiries@lloydspecialistdevelopments.co.uk

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Courtesy of: ***Lloyd Specialist Developments Ltd***