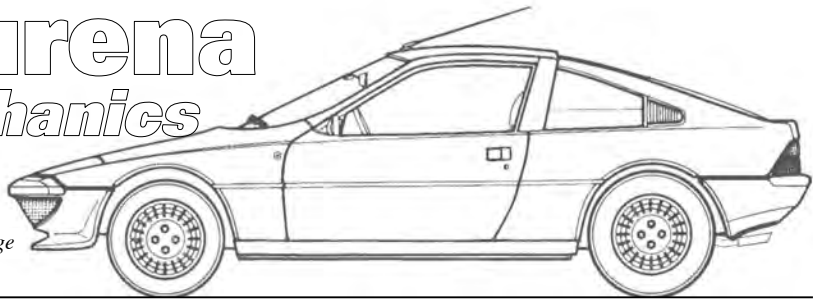
Murena mechanics



Dave Pethybridge

DIY Brake Tool

I have a 2.2 Murena, but here in Spain this is even more a rarity than in the U.K. Keeping the car maintained is not too difficult because these are quite simple cars especially compared to todays computer networked laden products.

However there are always a few jobs on any car that are either very difficult without the right tools or damn near impossible! The rear brake caliper - and in particular stripping and rebuilding the hand brake mechanism is one such Matra job.

At one point owing to a fault I hadn't detected at that time, namely the rear caliper not self adjusting owing to a sticking system, I 'lost' the hand brake altogether. I had an admittedly long hand brake one minute and the next application something appeared to break as I suddenly had no hand brake at all. My first thought was that the cable had broken, but after a quick inspection that proved to be fine. In fact I could see nothing amiss.

Being a member of the Matra Enthusiasts Club, I emailed Roy Gillard for help. His immediate response was 'The wedge in the hand brake mechanism on one side has been knocked out owing to too much lever travel being required, so you will have to strip and rebuild the caliper. The wedge will still be there, but stuck in amongst the grease inside the rear rubber boot.

Now this particular job requires a special tool, which is no longer available. It is so awkward and fiddly and requires so much pressure that you simply cannot do this by hand. So I was going to need to devise some tool of my own.

First job was download a copy of his brake booklet then remove the caliper, get it to a bench where I could strip and clean it to

stop it sticking and see exactly what was required to refit the wedge. Since there is a small groove around the casting that the rubber boot clips onto, and the special tool also uses for a fitting location, I could see that I could use this for the feet of a puller to hook in to, but as this is so small I needed something to make sure the feet stayed hooked in and would not slip out and off at a critical moment. So I thought an oil filter strap might be a good idea to wrap around the legs of a puller to stop them splaying outwards and coming off.

I was also going to need something to press down on the Belleville washers to compress them, and keep them compressed, yet still allow me access to get the wedge back in when the lever arm was refitted.

I used a No 1 hub puller (from stock) with two nyloc nuts on the threaded stem, an oil filter strap tool (€5 in a car boot sale!) and a piece of steel tube hand drilled, cut and filed to match the shape of that part of the tool. I've attached photos showing the parts used.

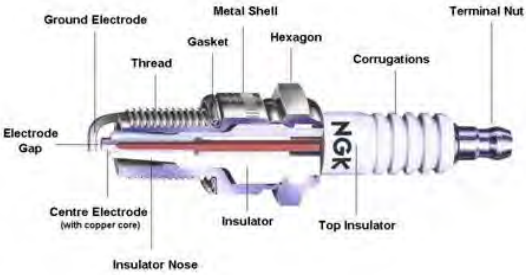
Working at the bench vice it took about 3 hours to assemble all of the components. I had to leave it a couple of times and take a break! Very difficult as Roy had said in his email, but with the tools able to keep the Belleville washers compressed whilst I attempted the refitting, I eventually managed it, and had the satisfaction of getting it all assembled and working again.

Photos: Dave Pethybridge
Text: Roy Gillard

Technical...

Spark Plugs

Roy Gillard



Spark plugs

These are generally so reliable today they are taken for granted. It can be baffling though if unknowingly the wrong ones have been fitted because no-one expects the plugs to be the cause of a problem.

To give you one example I came across a few years back, on a certain Renault with automatic transmission controlled by a computer, the 'wrong' plugs had been fitted during a service by a non-franchised garage. The plugs were a good brand and supposedly the correct ones for the car, but they were not the Renault approved plugs, which in this case was extremely important. It appeared that even good brands that were not approved could interfere with the electronics causing erratic gear changes!

Multi-earth electrodes

A common problem that I have mentioned before is the modern multi-earth electrode and/or special material plugs that require much higher voltages which modern cars use. These should never be fitted to older classics using simple distributor caps and H.T. leads and particularly those with points and condensers. They will often cause difficult starting and poor running because the systems cannot generate or handle the high power required for them. Old systems can handle say 26kv but not the 40kv or more these plugs require.

So stick to nice simple copper, single earth electrode plugs (as above) and if you use a good brand the engine will run fine.

Bosch plug showing the multi-earth electrodes. N.B. special 12 point bi-hex fastening on this one!

Plug Coding

The coding on any plug may be baffling and provided you use the correct ones as listed you don't need to know what it means but if for any reason you cannot get the ones you want, it may be useful to understand a little of this coding.

First we have the size of the plug, which traditionally were either 14mm, or 18mm, although some of the newer cars use these very small 10mm ones. This is the thread diameter. Most have a flat seat with a crushable washer to seal but you can have a taper seat with no washer (the 18mm ones were often like this). Then there is the length of the thread and for years the common ones were ¾" or ½" but again today there are others now, some being at least 1" long. Next we have insulators that are either flush with the metal body or projected beyond it; and there is the

working temperature range denoted by the number. Finally we now have various different materials for the electrodes.

Taper seats

Be very careful with tightening if you ever have to use a taper seat plug. (fortunately none of our Matra use this type) You only need 10 lb.in. for them to be correctly tight, which is so low most people will over-tighten them easily by hand! The problem with an over-tightened taper seat plug is they can be impossible to remove later!

Example coding

Taking the Murena as an example the ones I recommend are NGK BP6ES and the code BP6ES breaks down as follows: the 'B' denotes it is a standard 14mm plug and the 'P' signifies a projected insulator nose. The '6' is its temperature rating, the 'E' is the length of the thread, ¾" in this case, and the 'S' signifies the centre electrode type which in this case is a standard 2.5mm diameter copper core. An 'R' after the 'P' (BPR6ES) means they have an internal interference resistor fitted and some years ago these could be important to stop radio electrical interference. However these resisters were known to break down sometimes and cause misfiring, so I prefer plugs without resistors especially as we have little problem with interference today.

Temperature number

One reason you might want a non-standard plug, is because you have uprated the engine, say by increasing the compression ratio which has caused an increase in the chamber temperature. This might require a plug with a slightly different temperature number. This is where it can get confusing since the numbers go from hot to cold but they are not always consistent.

The confusion can be because it depends whether you are considering the temperature of the combustion chamber or the plug. The plug has to remain in a certain range to work well all the time, so if the combustion chamber is hotter you need the plug to get rid of its heat quicker to remain in its correct range. This plug would be classed as a colder plug as it gets rid of the heat quicker to remain correct. So you use a 'cold' plug in a 'hot' engine and vice versa.

However to further confuse things some manufacturers classify their numbers from low to high, increasing as they get colder, whilst other do it the other way around so the higher the number the hotter the plug! Bosch even swapped around when they changed from their old number system to their new numbers!!

Projected insulator

These became more common after the sixties and by sticking the tip further into the mixture flow, ignition was better but this also changed the plugs running temperature, because the mixture flow had a cooling effect. So for example, a Champion N5 had to be replaced by an N9Y (the 'Y' signifies the projected tip) and the temperature rating had to go from 5 to 9 for the plug temp. to remain correct.

Plug code charts

One of the benefits today of the internet is that you should be able to find a plug code chart for any common spark plug, that will give you a key to that particular manufacturers plug codes, so for instance I have Champion, Bosch and NGK plug code charts which can be useful when checking the specification of any plug.

cont. over

Oddities

Occasionally you get a car or engine that requires a particular plug to run properly just like the Renault auto I mentioned near the beginning. In the early seventies I remember doing a service on a new Honda car and we fitted the only make of plugs we stocked at our dealership, which were Champion. We chose the correct ones according to the chart yet after the service a brief road test showed it had a slight misfire under certain conditions.

When we checked with the Honda dealer, they said 'Oh yes, fit some NGK plugs and it will be fine', and they were right! The Honda did not like the Champions. NGK were fairly new in the U.K. at that time, since foreign cars were only just gaining strength here. Hard to believe now, but if you check any photos of traffic here in the early sixties foreign cars were rare. All the British vehicles whether BMC, Ford, Rootes or Vauxhall all generally used Lucas electrics and Champion plugs so they were the most commonly stocked!

Plug gaps

Take care with new plugs. When every car used points and condenser type ignition, or the early Hall effect electronic ignitions like the Murena uses, the plug gaps were usually 25 thou (0.65 mm) and so new plugs were already set to this gap. Even then you should always check every new plug gap before fitting. It would be easy for one to have been dropped and the gap closed up. If you fitted say one plug with little or no gap without noticing, you could end up wasting a lot of time tracing a misfire after your service, which was probably nothing more than that one incorrect spark plug gap! Also don't ignore a possibly faulty plug - you do get them.

We have many engines now using solid state ignition systems with high powered coil packs or coil-over-plug units with no distributor cap or H.T. Leads, and they generate so much power that the plug gaps are much wider to take advantage of that, giving longer sparks. Consequently many new plugs are coming already set to these wider gaps.

You must close these back down to the correct gaps for our cars before fitting them. If you don't you will usually find starting is very difficult, if you can even get it to start at all, and the general running is not great either. So make sure the gaps are correct for your engine.

Plug listings

Many internet suppliers now stock modern plugs and want to sell you them, particularly as they are often much more expensive. They may have platinum or iridium electrodes (*below*) and be claimed

Example of a plug with a special centre electrode - note tiny diameter

to be the 'best thing for your engine' but most of these suppliers know little about engine technology and certainly don't understand the different requirement of older classics. So stick to the manufacturers original listing for your engine.

Roy Gillard