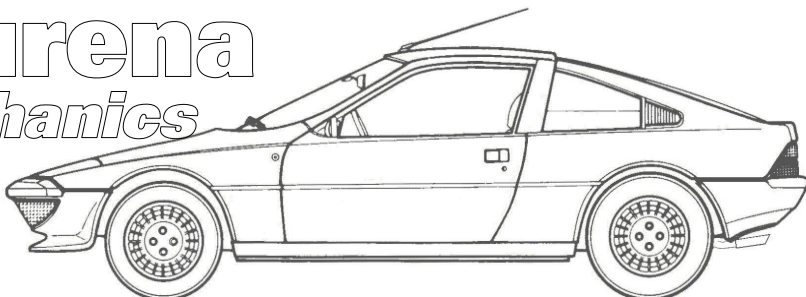


Murena

mechanics

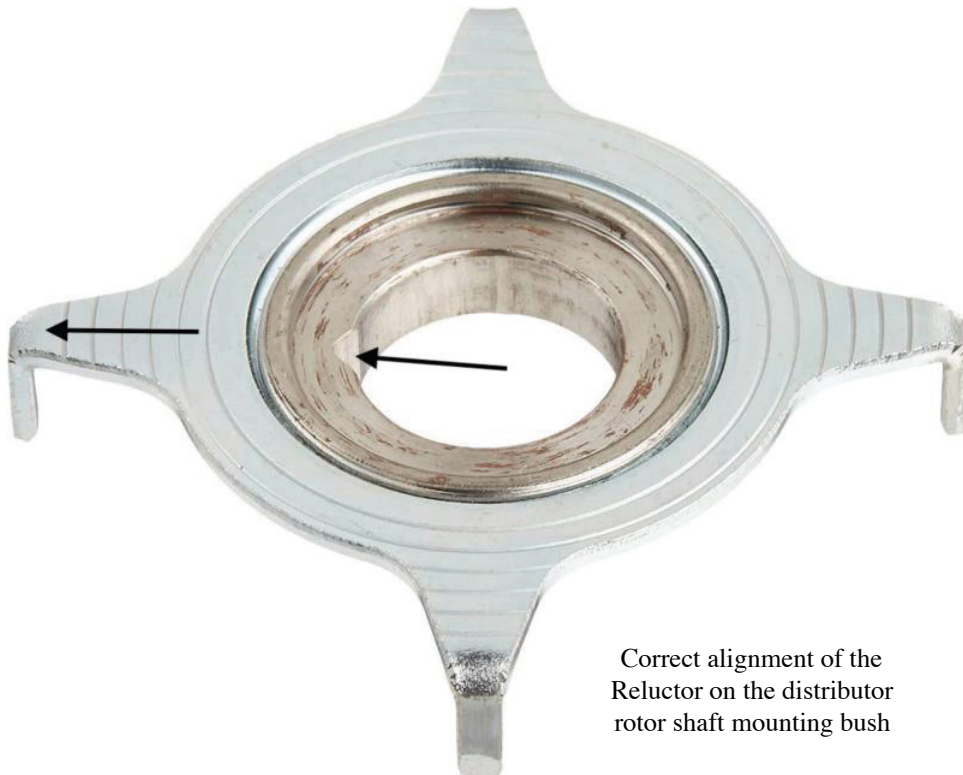
Roy Gillard



Bosch Reluctor problem

This technical article **only** applies to the Murena 2.2 and the Type 180 engine with the original Bosch electronic distributor. That's Bosch part number 0.237.002.069 which is stamped in the body side with an arrow indicating clockwise rotation as seen from above.

I have seen this fault now in at least half a dozen cars and it seems to be happening more as these cars get older, so I would advise anyone with a 2.2 Murena, especially if it has had any engine running problems, to check their distributor, which should only take a minute and requires no tools, so it is a pretty easy check to carry out.



Correct alignment of the Reluctor on the distributor rotor shaft mounting bush

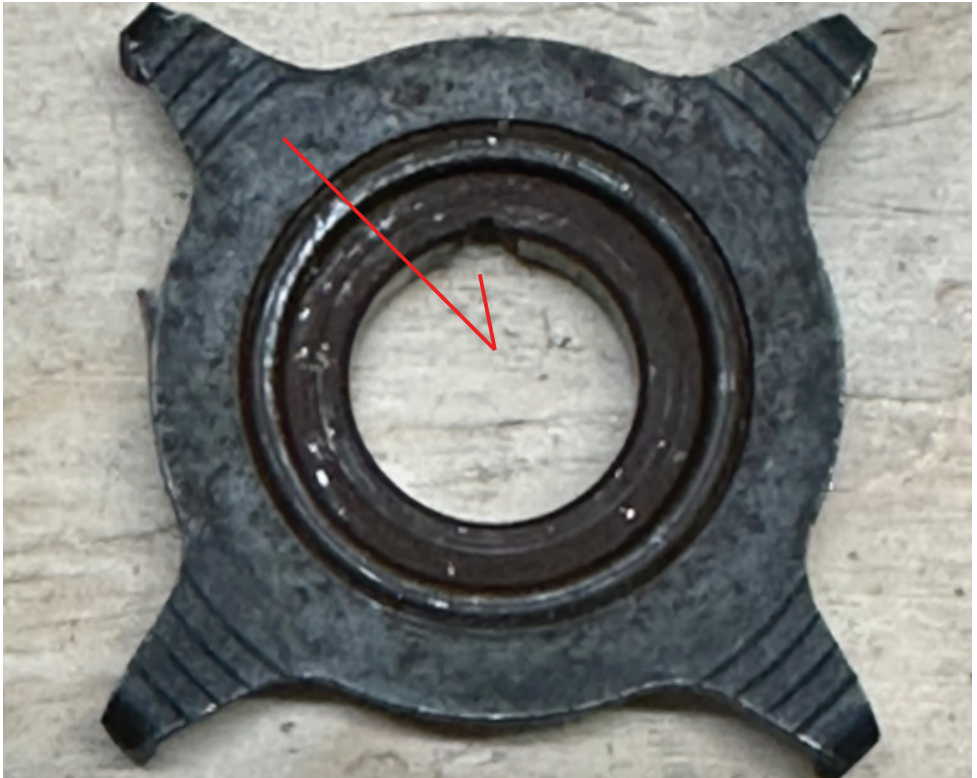
To check it, all that is needed is to remove the distributor cap, rotor arm and the flash shield if that is still fitted, and look carefully at the relationship of the four Reluctor 'fingers' in relation to the groove in the bush it is press fitted on to, as in the photo on the previous page, of a new Reluctor. One Reluctor finger should be in line with that groove in the bush, as indicated by the two black arrows in the photo.

You will also see, if you look carefully at the distributor rotor shaft, it has a small groove down it, and the bush groove is locked in place to it by a tiny pin, of which you should just see the top, unless the small circlip is in the way, but you could move that out the way.

Why is this important

The reason this is important is that when the Reluctor fingers, which are rotating with the rotor shaft, align with the virtually stationary fingers approx. every 90 degrees, that triggers the firing of a spark plug. I say virtually stationary fingers, but these do move slightly as the mechanical and vacuum advance mechanisms alter the timing slightly as they function to produce the timing advance curve for the engine.

Now at the moment the fingers align and trigger the spark, the rotor arm **must** also be in alignment with one of the segments in the distributor cap, so that the ignition pulse passes down



the H.T. Lead to a spark plug. If the Reluctor has moved out of position, then when it triggers the coil to fire a plug, the rotor arm will no longer be correctly aligned with the distributor cap segments, and the pulse will have to jump to the segment, losing some of its energy and the spark at the plug will be much weaker as well as late.

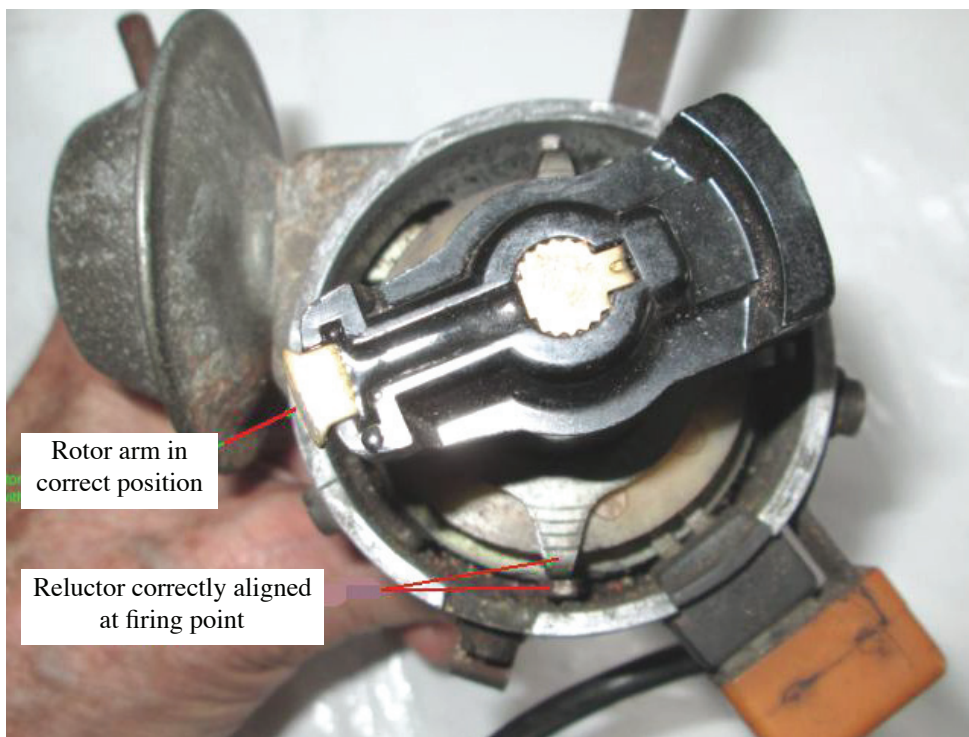
The further the Reluctor is out of alignment and the greater the distance the rotor arm tip is from a segment, the worse the performance will be, as I'm sure you can understand.

The photo on page 2 and this one on page 3 show a Reluctor that is out of

position on its mounting bush, because it has rotated over a period, and this means the rotor arm will not be close to a cap segment, when it triggers the coil. In the photo on this page the rotor arm is close to where a distributor cap segment would be, but if you look at the Reluctor fingers, they are nowhere near the stationary ones, so it is nowhere near the timing/firing point.

Now if you check out the photo on the next page, where the rotor arm is in approximately the same position with the tip near a distributor cap segment, the Reluctor fingers are correctly aligned with the stationary fingers triggering a spark.





Unless your distributor Reluctor is still correctly positioned on its mounting bush, and therefore the triggering of the firing pulses are when the rotor arm is correctly aligned to be close to a distributor cap segment, then it will cause all sorts of problems with the running of the engine.

Now you might not notice a fault at low revs especially if the Reluctor is not far out of position, but it will start to cause problems at the higher rpm as the timing advances and causes the rotor arm to be further away from a segment.

And the spark at the plug will be weaker because it is losing energy having to jump from the rotor arm tip to the cap segment.

You may find the engine harder to start, and then it may not idle well or even at all, or it may not want to start at all, no matter how you set or adjust the carburettor or timing.

The first thing you may find when the Reluctor first moves from its correct position, is that the timing will be out. And that will be the first puzzle, since the distributor will still be clamped tight, and as it is a contactless system, that doesn't make sense. How can the timing alter when apparently nothing has changed! And that will be the indication that the Reluctor has moved, which is something that should never happen and something you would never expect, but on these distributors, sometimes it does!

I believe that when the engine bay gets really hot after the engine has been running for a while on a long journey, some Reluctors, which are only a light press fit onto the bush that is locked to the rotor shaft, expand sufficiently for them to move as they are no longer as tight as they should be.

To get the alignment back, the bush and Reluctor need to be removed from the distributor, by removing that tiny circlip and prising the bush up off the rotor shaft. Be careful to retain the small locking pin as that will be needed when refitting it, to lock the bush correctly to the rotor shaft.

Once out, you can realign the groove to the correct position, but it will probably need the assembly warming first as the Reluctor will probably still be tight and difficult to move when cold. It doesn't have to be in an exact position on the bush as long as the finger is roughly central to the groove as in the photo of the new one on page 1.

Once the Reluctor is in the correct place on the bush, then you need to lock it in place to prevent it moving again. And I would also mark it across from the bush to the Reluctor with maybe a small white paint line, so you can easily spot if it ever moves out of alignment again.

Now you can refit the Reluctor and bush, fit the locking pin, and circlip, then check the finger clearances. Next refit the flash shield, rotor arm and distributor cap, and you will now need to check and if necessary, reset the engine timing.

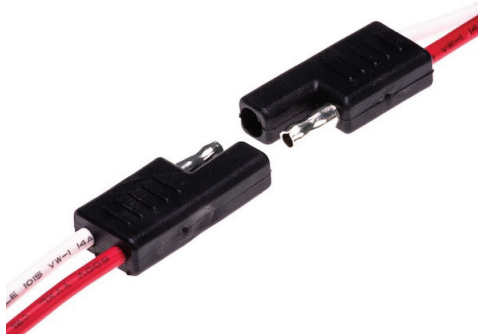
Trigger coil and wiring

Whilst this article is primarily about the Reluctor fault, I would like to point out a couple of other possible faults which you could check if you have any ignition problems. You should check the resistance of the distributor coil which creates the magnetic field necessary in this electronic distributor.

In the previous page photo, the orange plug, which is held in place by its bracket screwed to the distributor body, has two terminals that connect the shielded wiring to the distributor coil. Removing the screw allows you to pull the plug away to reveal the two coil connections. Now this coil is a polarity conscious item and on the plastic housing holding the fine coil winding are marks A and B. 'A' is the positive connection and 'B' the negative. 'A' connects back to pin 5 of the ignition amplifier and 'B' connects to pin 6.

You can test the coil at the two pins and the resistance should be 1000 ohms plus or minus 100 ohms. If the coil itself is incorrect then you will need a new one, but that may prove difficult to get today. If it is good, refit the distributor plug and test again across pins 5 & 6 in the amplifier plug and you should still get 1000 ohms plus or minus 100. If you do then all is good, but if you don't, then a fault lies somewhere between the distributor and amplifier. In this case you need to inspect the wiring between the distributor and amplifier and the obvious place to check first is the polarity plug approximately 8 inches back from the orange plug.

This plug is a special twin plug designed so it can only fit one way to keep the polarity correct, similar to the one in the next photo. They are sometimes known as a 'sea-dog' connector if you need to search for one.



The difference is that the two wires in this photo are separate while the wiring lead between the amplifier and distributor on the Murena is a shielded lead preventing any interference to the tiny signals passing along it and causing ignition problems. So that one lead contains two small wires with a wire mesh surrounding them, all along the length from amplifier to distributor.

Now if that lead has ever been damaged, repaired or replaced by normal wiring, first the polarity of the connections is important, and second it really should be shielded wiring not just normal twin core wiring. If you look at the distributor picture on page 3, you will see that where the orange plug should be, there are two yellow terminals plugged onto the distributor coil pins. That means the wiring is not original and has been replaced by normal wiring, and we don't know if the correct polarity has been maintained, so that needs to be checked.

The next photo shows why that particular repair had been done. The original wiring polarity plug had become damaged probably by the plug resting on the vee-belt for the alternator and coolant pump at some time. The problem is that those replacing that connection do not always realise the importance of it being both shielded wiring and also polarity conscious. This



polarity plug is usually under the inlet manifold and out of sight. Please make sure any wiring is held away from the fan belt or any moving parts.

Another fault I have come across is that the two pins in that polarity plug were badly corroded and green, owing to the plug not being fully closed up and water having got in. This caused the resistance to go sky high and measure in mega ohms, and consequently the engine would not run. Yet the solution in that case was simply to clean the terminals and once the resistance at the amplifier was just the 1000 ohms of the distributor coil, the engine started and ran fine, and the cost of repair was almost nothing, when the owner had been contemplating lots of money to replace the distributor and/or amplifier!

Always test and diagnose properly and find out where the fault lies before spending lots on parts that may be unnecessary.

Roy Gillard