Changing Miata Spark Plugs

There comes a time when the spark plugs in your Miata will need changed. Some people go the full factory interval, and some like to do it sooner to try to maximize performance or gas mileage. Your handbook should be your guideline as to the proper interval to replace them. But note that removing the plugs and cleaning them to reset the gap in the middle of the replacement interval can also be an inexpensive way to help maximize the performance of the engine.

A dirty, worn, or improperly gapped spark plug will result in poor performance and gas mileage. A lot of people think that the gasoline explodes in the cylinder when the plug fires, but the gas and air mix actually does a controlled burn. The speed of the burn is extremely fast, but it is a controlled burn none the less. The octane rating of the fuel controls the speed of the burn, as well as the spark that starts the burn. If a spark plug is not gapped properly or dirty, the spark may not be hot enough to start the burn at the correct speed resulting in lower performance or poor gas mileage. You may notice a lot of modern cars have the spark plug in the center of the cylinder. This causes an even burn in all directions at the same time. But if a plug has a lot of dirt on one side, it may only spark to the other side causing an uneven burn in that cylinder.

Changing spark plugs is one of the easier things you can do to help keep the motor running its best. **Note to always do this when the motor is COLD**! You need a ratchet wrench & extension, a spark plug socket, spark plug boot release, and high temperature anti-seize for on the replacement spark plug threads. As a note, not one Miata ever had a distributor like most older cars. All plugs are fired thru a coil as a result of the computer triggering it to fire. The earliest "NA" Miatas have one coil and a spark plug wire for each cylinder. You just pull this wire up and off of the spark plug to gain access to it.

In the picture to the left, you will see the middle "NB" series which have a "C.O.P." (Coil On Plug) set up. Two of the plugs have a C.O.P. unit on one spark plug, with a wire going to a second plug. Essentially 2 spark plugs fire every time a coil is triggered. One piston is up on compression, so that plug causes the power stroke. The other piston is up on exhaust stroke, so that plug fires for nothing. It is a simple way to fire 2 plugs with one coil, and is called the "Lost Spark Method". The picture to the right is from the newer "NC" series. The newer Miatas have a "Coil On Plug" unit for every spark plug. Mazda realized this is better over the earlier years as now a hotter spark can be sent only to the one plug firing which gives a little more power.



To change the plugs you first have to remove the spark plug wire, or the C.O.P. units. If you have a "NB", use your socket wrench to remove the bolts which holds the 2 C.O.P. units in place.

If you have a "NC", first lift off the plastic cover that sits over the spark plugs. This is just held in place by rubber grommets, so it just lifts up. Then remove the 4 bolts which hold the 4 C.O.P. units in place. The next step on all cars is to lift up the plug wires and or the C.O.P. units. This can be difficult if they have been in place for a while. The rubber boot seals around the spark plug and can stick to the plug. Twisting the wires or C.O.P. units side to side a little can be a big help. The picture to the left below shows all 4 of my C.O.P. units removed and my spark plug socket down over a spark plug. I am now ready to remove the plugs. Always remember "Lefty Loosey, Righty Tighty". Do not turn the ratchet the wrong direction while trying to remove the plugs. Just as a note, use a little duct tape to hold the spark plug socket to the socket sticks to the plug down in the hole, it will be hard to get the socket back out.



The picture above right shows the spark plug wire boot protector/release. Put a little bit on the inside of the end of the spark plug wire before pushing it down in place. This helps keep the spark plug wire from sticking to the plug making the next change easier. The aluminum colored anti-seize is for the plug threads. This keeps the plug from freezing in place and making them difficult to remove. Just put a tiny bit at the end of the threads as in the picture, and it will spread it self over the threads as it is screws in. It is best to use a torque wrench when tightening the plugs. Too loose and the plugs can actually work up and out of the threads. Too tight and you can strip the threads in the motor, NOT good! Torque specs are easily found.

A couple notes before you buy the new spark plugs. Buy a good quality plug and be sure to set the plug gap. Only use the standard recommended plug in the earlier NA and NB Miatas. The "lost spark" set up on the earlier Miatas does not make a hot enough spark to properly fire the high end Iridium spark plugs. Your car will run worse and performance will suffer. Use the standard NGK plugs your handbook asks for and you will be pleased with the results.

BUT,..... The newer NC Miatas have a C.O.P. unit on each plug. This requires the newer high end Iridium spark plugs to give you the best performance. But they are more expensive, about \$16.00 each. To offset this Mazda states they will run in the NC motor for 75,000 miles. You can buy the NGK spark plugs the handbook suggests, or we do have an option. As Ford Motor Company had a hand in the design of the motor, we can substitute the "Autolite" Iridium Spark plugs # XP5364. This is an Exact replacement for about 1/2 the cost. Many of the guys at Miata.net have used these, and I recently bought a set when on sale to have for when I need to replace mine.

Below is a picture of the sparks plugs out of my 2006 Miata. I took them out at 25,000 miles to check them. Since they had been in place for 5 years, I was concerned that they might be

stuck into place and if so waiting longer would just make them worse. I was happy to find they were not stuck and came out OK.

Look at the tips of these plugs in the picture. See how they are relatively clean with light tan deposits? Look at the center insulator and see how clean it is. This is a sign of the proper heat range spark plugs in an engine that is running properly. Any Black deposits, or any build up of deposits can signify a problem in the engine. Different deposits can point to different problems.



After installing the plugs, put the wires, C.O.P. units, and the cover for the NC in place, and go enjoy your car with its new components

Zoom-Zoom! Bill Latsha