

SPARK PLUGS OF A CAR

What are they and why should you care?

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Spark plugs are an essential component of an engine that most drivers have heard about. However, most don't know the subtle details of spark plugs, including how to maintain them, how to replace the plugs and most importantly, look out for the symptoms of good or bad spark plugs. To learn more about spark plugs check out these four main things for drivers to keep in mind.

What is a spark plug?
As the name suggests, spark plugs are used to generate a spark of electricity that ignites an engine's air/fuel mixture to create an explosion, which makes the pistons move in the engine to produce power. That power puts the pistons in motion and gets your vehicle up and running. These simple small plugs create an arc of electricity throughout the leads which aren't touching but remain close enough so that electricity can leap the distance between them. Spark plugs, together with the electricity and timing system which powers them, are a part of what's referred to as the ignition system. Without spark plugs, the engine won't even start. Generally, they are made of durable materials which can withstand



When and how to replace spark plugs?
There are two types of spark plugs to keep in mind: Conventional spark plugs which need to be replaced every 50,000 to 80,000 kilometres, and extended/long-life spark plugs which need to be replaced 100,000 to 225,000 kilometres depending on the vehicle. The recommended replacement intervals can usually be found in the owner's manual or separate warranty and maintenance brochure. They may also need replacement when the symptoms of bad spark plugs show up. Before removing old spark plugs and installing new ones, make sure the engine is cool. Clean the engine bay of any dirt and debris to prevent anything from falling into the engine cylinder

gets poor fuel economy or becomes louder than usual - indications that the spark plugs are in a horrible state. **What causes spark plugs to wear out?** Wear of spark plugs is naturally unavoidable over the course of a vehicle's life, as the eventual build-up of oil and carbon is bound to dull their effectiveness. They can wear out faster due to overheating from the incorrect air/fuel ratio. Poor quality fuel, bad oil filters and bad air filters can lead to more build-up of carbon, oil and dirt. Problems can also be caused by loose wire connections from low-quality plugs or improper tuning of the engine. It's best to keep an eye out for these problems and prolong the life of spark plugs.



during the process of replacement of plugs. Ensure disconnecting the battery for extra safety. Remove the spark plug boots one at a time and then remove the spark plugs one at a time and inspect for damage, build-up or foreign materials. Then, replace the old and worn-out spark plugs with new ones the way the old ones were pulled out, but make sure not to cross-thread the plug or over-torque when replacing them. Reattach the plug boots to their specified location. Reconnect the battery and then start the engine to make sure they are connected properly. It's best to get the spark plugs replaced by a professional mechanic as different cars may have different procedures for replacement.



millions of explosions before needing to be replaced. When they are worn out, they may not make any sparks or create weak sparks that can reduce fuel efficiency, misfire which can damage the engine and perform incomplete combustions which can also damage the catalytic converter. **Symptoms of good and bad spark plugs** It's important to look out for signs of good and bad spark plugs which can determine whether they need to be replaced or not. If the car is running smoothly and without a hitch, the spark plugs are maintained very well. If the car has trouble starting, the engine idles, the car struggles to accelerate, the car loses power, the engine misfires, the vehicle



First-ever Bangladeshi custom mechanical keyboard project 'Kebab'

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The mechanical keyboard user community is growing at a fast pace in Bangladesh. However, the enthusiasts and even the average user mostly use imported foreign keyboards and accessories because they are neither locally available nor manufactured, making them relatively more expensive. Mechanical keyboards are different from usual rubber membrane or scissor-switch keyboards in many ways. Each key on a mechanical keyboard has its own switch and it registers as a keystroke if the key is pressed down firmly enough. A mechanical keyboard uses distinct elements that may be customised in most ways imaginable. Although not fully ergonomic, it is considered to be more ergonomic than average keyboards making it more comfortable to use long-term.

"Kebab" keyboard by KeeBot is the first-ever Bangladeshi mechanical keyboard project. KeeBot is an independent creator of mechanical keyboards and related components in Bangladesh. Founded only a year ago, they have received much appraisal from the local mechanical keyboard enthusiast community at a fast pace. The team is co-founded and run by Sadnan Adib and Samiul Bashar Anan. It recently completed its first batch of product delivery as well. In the enthusiast community, this is known as "group buy," essentially pre-ordering a keyboard by many people at once. The keyboards are then created and delivered to those that completed the pre-order. Approximately three months



were required to complete all delivery of Kebab keyboards first "group buys" project.

A few aspects set the Kebab keyboard separate from most others. It offers excellent pricing and its form factor, and it is designed and assembled in Bangladesh. According to the founder of KeeBot, Sadnan Adib, "Kebab was



initially a different-do personal project, which when shared to the public was turned into a project in public support." On pricing, the Kebab keyboard retailed at 7,500 BDT per barebone kit. A barebone kit is a mechanical keyboard kit that does not ship with switches or keycaps. On average, any other barebone kit of Kebab's similar form factor retails

at a much higher price. They cost no lower than 100 USD and as high as 250 USD in general, roughly equivalent to 9,000 BDT to 24,000 BDT as of now. Such keyboards also need to be imported, meaning there are additional charges and logistical difficulties on top of the product price.

The form factor of Kebab is not like



most everyday keyboards. It is available in the Alice style, a keyboard divided down the middle, with little space bars and B keys on both sides. Moreover, it comes with a small, customisable screen on the right side. The keyboard is fully customisable by the free-to-use (open source) software VIAL. By default, it shows a cat typing on the screen when anything is typed on the keyboard. It also has a LED light on the left panel, which is also customisable. The keyboard is hot-swappable for both 3-pin and 5-pin switches, meaning any switch can be used on it and can be changed anytime. The keyboard is also gasket mounted, so using it potentially feels easier on the hands. It also has a rotatable knob on the left panel, which

may be used for volume control, screen scrolling and other cool features.

The keyboard is designed and assembled in Bangladesh. The KeeBot team did the circuit design and the 3D modeling for the board. Many materials used, such as the case, were also from Bangladesh. What needed to be imported was the PCB board and screws due to compatible units not being widely available in Bangladesh. Hopefully, over time, it may someday also be compatible and produced locally, too, expressed the team behind the keyboard.

"Upon receiving the Kebab keyboard, our customers offered positive and constructive comments. It helped us develop our moral boost and understand how we can develop in future projects," added Sadnan Adib. "Support from friends and family played a big part in this challenging journey," he adds.

The KeeBot team is working on future projects at this time. They are now also working on creating more conventional form-factor keyboards. If demand goes high, they might create more Kebab keyboards.

The Alice-style keyboard belongs to a niche enthusiast market and may not be suitable for the masses. However, the step of KeeBot to create this project is vital to support and uplift the local mechanical keyboard community. It also takes a step forward to uplift the barrier of expense, making it more affordable and accessible to many who otherwise would not be able to experience such custom mechanical keyboards.