

Lucas 2MC Capacitor Warning

1967 was the last year for the Lucas Energy Transfer (or "ET") ignition system for use on British competition motorcycles. In an effort to streamline production and to meet US import laws, starting in 1968 Triumph and BSA sold only "road" bikes with the battery/coil ignition. If you wanted to ride off-road or race you were forced to buy a road legal motorcycle, remove the lights and otherwise prepare it for competition.

Part of that preparation included removal of the battery and battery tray. The battery, which was required for proper functioning of the battery/coil ignition, was replaced with the Lucas version of the "battery eliminator", otherwise known as the 2MC capacitor. The 2MC was a large electrolytic capacitor that connected to the harness in the same manner as the battery, but weighed about 1/100th of the battery.



Starting in 1968, Norton P11's also came from the factory with a battery and a 2MC capacitor fitted. Again, the P11 was a competition machine and most P11's ended up with the battery removed. Then, starting about 1970, all Commandos came fitted with a battery and the 2MC. By installing both, Norton was able to hold the system voltage at high levels even though the battery may have started to age and slip below 12V.

Later on, in 1971 BSA and Triumph introduced a series of "oil in the frame" 250cc and 500cc single cylinder motorcycles with an aluminum electrical box just behind the head post and below the fuel tank. The idea was that if you wanted to ride off-road all you had to do was remove the lights, battery and electrical harness. All electrical functions required for dirt riding were contained in this compact electrical box. Inside the box was the battery eliminator, the blue 2MC capacitor.

That was fine in late 60's and early 70's. The capacitors worked well and allowed many riders to be free of the weight and maintenance of a battery. However times change, bikes values increase, and their owners get better looking. Unfortunately, the 2MC capacitor is not aging as well. It is well known that some types of capacitors (aka "condensers"), especially the electrolytic type, have a limited life span. Apparently for the Lucas 2MC, that life is limited to about 30 years.

Internally, capacitors are nothing but 2 large pieces of conductive foil separated by a very thin insulating film. As this insulator breaks down over time, a very small trickle of electrons begins to make a path between the 2 charged foils. Since the capacitor is not supposed to pass any electricity the path is technically a short circuit, but the starting amount is so very, very small. However, just like a small leak in a earthen dam, soon the trickle turns into a small flow, then a torrent. In the same way 2MC capacitors start life as a good insulator, then become a small resistor, and finally after many years end up as a short circuit.

No less than 3 times in the last month I have had to diagnose and remove 2MC capacitors that were faulty. All 3 had developed into "near short circuits" that were draining the battery, but offered enough resistance that the fuse wasn't being blown. All 3 owners complained of batteries that constantly had to be charged, even though the bike was ridden regularly. The bike would run good, but due to the internal failure of the 2MC, the electrical system acted as if the tail lamp had been left ON when the motorcycle was parked. The owner always came back to find the battery was dead.

When a 2MC works properly it can disguise the fact that the battery is dying until the owner is left walking. And when the 2MC starts to fail the owner may buy several batteries before discovering the actual problem. When you add to this electrical game of hide-and-seek the fact of its inevitable failure, you may decide that having a 2MC in your electrical system might simply be more pain than it's worth. Therefore, if your bike is equipped with the bright blue Lucas 2MC capacitor that was fitted as original equipment, in my opinion the best thing you can do is to disconnect the RED wire from the positive terminal. After disconnection, the RED wire should be insulated with heat shrink tubing to prevent accidental re-connection.

If you decide to replace your 2MC and keep your motorcycle completely original, then it's very important that you get a freshly manufactured unit. The ageing process that causes the problem happens regardless of whether the capacitor is sitting on a stock room shelf or installed on a motorcycle. In other words, a "new old stock" capacitor could be "bad" even though it was still untouched and in the box. If you are unsure of the quality of the capacitor your local bike shop has, then you can look for a 4500-microfarad electrolytic capacitor rated at 30V from an electronics supply house.

Hope this helps!

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