Testing a `suspect' Magneto Armature.

MANY machines have enjoyed a winter's indoor attention, whether it be just minor titivating or a full-blown re-fit, and emerge again for practical use at about this time of year, only to reveal problems in starting which, almost inevitably, can usually be traced to the sparks" department. Assuming that the ignition timing has not been disturbed during the fettle-up, if electrons are converted and supplied to the plug by a magneto, there are fewer bits and bobs that might be causing the problem than with a coil-ignition set-up, but these can be consequently more major. Once the plug has been changed for a nice shiny one, the points have been cleaned (or replaced with similarly shiny ones) and set to the correct gap, and the pickup brush has been checked, a) for its existence, and b) for its contact with a nice clean slip-ring, any further problems are likely to seriously delay that long-awaited ride and prove potentially expensive.

Apart from a failed capacitor, which is relatively inexpensive to replace but difficult to diagnose apart from the usual symptoms of burnt contact-breaker points and probable loss of spark, the only other causes of poor spark are a loss of magnetism or a breakdown of the armature windings. Loss of magnetism is something that, provided the instrument has remained in one piece, normally occurs only over (a long) time and would probably have been manifesting itself the last time you used the machine. Which leaves a breakdown of the windings, or their insulation (more likely). Such breakdown occurs more commonly due to damp, but may be due to excessive heat (unlikely in a garage in winter). Either way, even without instruments, the integrity of the armature windings and their insulation can be tested fairly simply, even with the instrument largely assembled, but more effectively if it has already been dismantled for visual inspection of the insulating coating.

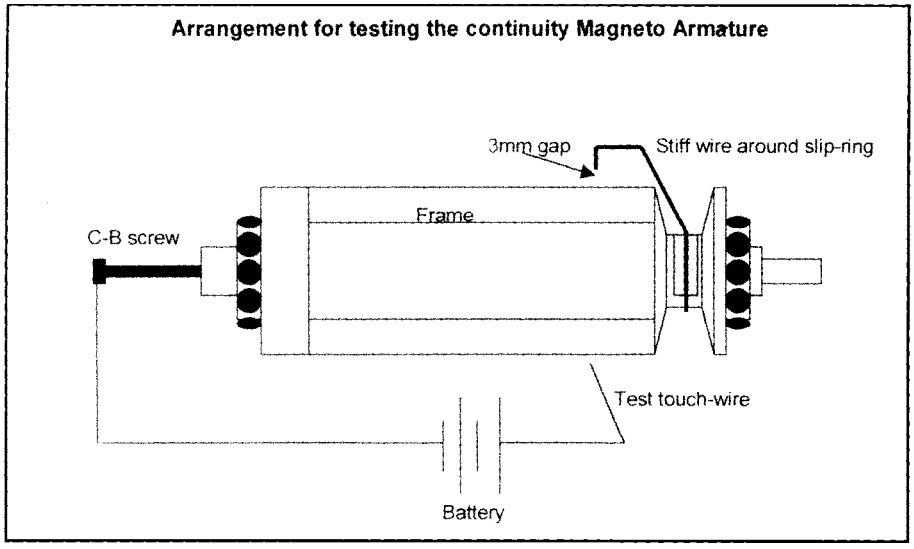
Dismantling:

With the magneto removed from the machine en-bloc, clean the exterior thoroughly before commencing to strip the instrument. A safety spark-gap screw is incorporated in the construction to protect the windings in the event of the plug or lead coming off at high speed, leaving the armature "open-circuit" with several thousand volts to dispose of. The screw is usually located under the body, diametrically opposite the pickup brush (on singles) and incorporates a gap into what would otherwise be a short-circuit of the HT line. "Spare" excessive voltage will jump the gap and protect the windings. Failure to remove the screw will prevent the withdrawal of the armature and/or damage the insulating flanges of the slip-ring. Another screw to look for, usually at the C-B end of the body conceals a small earth brush which must be removed (under the serial-number plate on later Lucas instruments). Most of the other items to be removed are more obvious, such as the contact breaker assembly, HT pick-up brush and body-assembly screws. NOTE ! before removing the armature, place a "keeper" across the magnets to retain the magnetism, any conductor of magnetism such as spanner or piece of M-S will suffice.

Inspection:

Early armatures will be wound with shellac-coated wire and, after long use (or misuse) may show signs of cracking of the shellac or sponginess to the touch. Either way, it's "had it" and requires rewinding which, for most of us, means enlisting the help of the professionals. There are specialists who will carry out the work, with modern materials that will not require you to have it done again in another 50 or so years. It is best to select one on recommendation.

If the insulation passes the above rudimentary inspection, the continuity of the windings and their insulation can be further tested by a simple bench-test. (See diagram) The test requires no more equipment than a small quantity of wire and a battery, (the one off the bike will do). One piece of fairly rigid wire (welding wire or cooper earth wire from 3-core cable is ideal) should be wrapped around the slipring, tight enough to make contact, and bent to a from to give a 3mm gap from the armature frame. Another piece of wire, flexible and insulated this time should be connected between the contact



breaker screw and one of the battery terminals. The other terminal should carry a loose piece of wire which can be touched-down to the armature frame to effect the test. With the components so arranged, touching the "loose" wire on the armature frame should produce a spark across the gap between the "slip-ring" wire and the frame. Failure so to do indicates something pretty fundamentally wrong in the windings department and the need for a visit to the kindly professional mentioned above to rewind the armature, or you might as well give him the whole lot and eventually get it back all sparkling and requiring you to merely reinstate it on the machine ready for the next 50 years.