

General Motor Knowledge
Part 9

Hipot
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Hipot is short for high potential which means the same as high voltage. Why do we high voltage test our motors? The following is taken from a book, "Basic Facts About High Voltage Testing" written by Elmer C. Slaughter.

Why do we hipot our motors? First and foremost, hipot testing is done for the safety of the customer. By applying an over-voltage between the windings and the endbell we "proof-test" the motor against grounds or shorts which at the least might cause inconvenience and at the most can cause deaths or fires. Secondly, hipot testing is a quality assurance measure. Impending failures in the insulation of any portion of the motor, whether due to workmanship, components or materials are detected by this means before the motor is shipped.

What is hipot testing? High voltage testing is "proof-testing". An overvoltage, greatly in excess of normal is applied between the parts of our motor that are supposed to be energized, the winding, and those parts that are not supposed to have any voltage present, the motor frame or endbell. When this is done all insulation is stressed abnormally for the duration of the test.

Why use such a high voltage - the motor is never subjected to any such voltage in service? A moment's reflection will supply the answer. In the plant we are dealing with new motors, clean and in a reasonable atmosphere. Consider that we have a motor with a wire spacing less than $\frac{3}{32}$ of an inch from the motor frame. Ordinary line voltage will not bridge the gap, and a motor tested at low voltage would be shipped as acceptable. But let's look at this motor after a year or two. House dust has accumulated in the gap, and the atmosphere is moist, - we have just given our customer a nasty electrical shock or worse. If the motor had been tested at high voltage, it would have shown "BREAKDOWN", the close spacing would have been corrected and our customer would still be our friend.

Before any other electrical test, our final electrical test stand operators will hipot each and every one of our motors at 2,000 volts for over one second. During this test we will have some "LEAKAGE", and we may have "BREAKDOWN". We will examine these terms next month.