

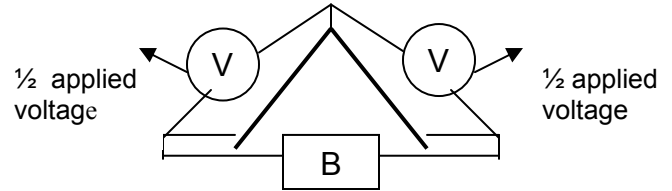
# IDENTIFYING UNMARKED LEADS OF A NINE LEAD DELTA CONNECTED MOTOR

This paper contains information that has been "out there" for a number of years and has been tested by many in an effort to safely identify the unmarked leads of nine lead delta connected motors.

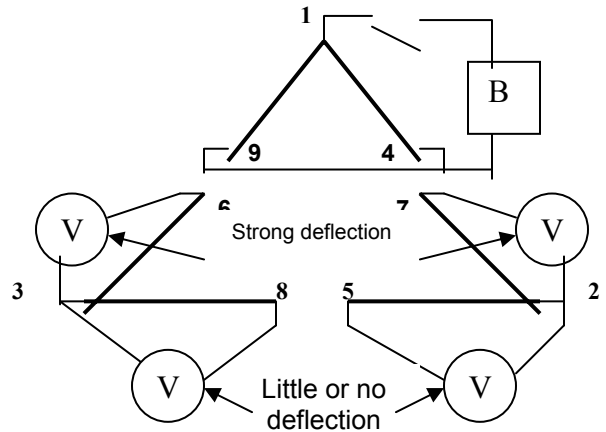
With the concern today for ways to work safely with electricity, especially in light of the 70E standard, this testing method is very good. There are many books, which go into great detail about ways to identify unmarked leads of motors, but the majority of those methods involve working with line voltages attached to the motor at the junction box. The following method involves using either a 6 or 12-volt battery, which is well below the 50 volts considered hazardous by the NEC and OSHA.

Equipment needed: Test light or ohmmeter, a 6 or 12 volt battery, low scale analog voltmeter and numbered labels. It is important that the motor be assembled, with the leads available at the junction box. The rotor is needed to complete the magnetic circuit. The magnitude of deflection of the voltmeter needle, rather than polarity, is used to identify leads in this test.

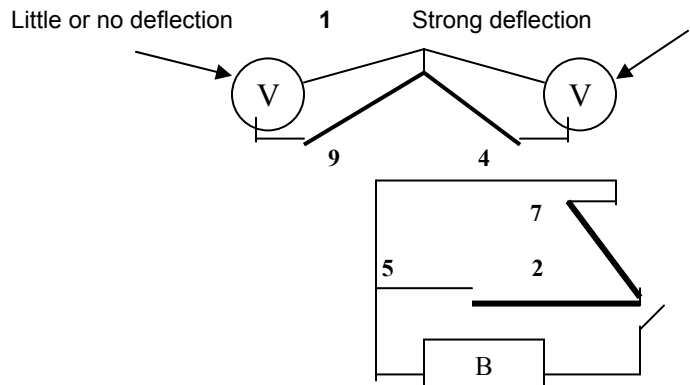
First, the 9 lead delta connection will have three circuits with three leads each. Identify the three center leads using the method illustrated. The lead will read  $\frac{1}{2}$  of the applied voltage, as shown. Label the center leads – 1, 2, and 3 respectively.



Second, connect the 1-4-9 circuit as shown. 4 & 9 are connected to the battery terminal. 1 is "flashed" with the other battery terminal. A strong deflection will occur across leads 2 & 7 and across leads 3 & 6. Little or no deflection will be seen across leads 2 & 5 and 3 & 8. Leads 5, 6, 7, and 8 can now be labeled.



Third, connect leads 5 & 7 to the battery and "flash" lead 2 as illustrated. Leads 1 & 4 will show a strong deflection. Leads 1 & 9 will have little or no deflection. Leads 4 & 9 can now be labeled.



This article was compliments of Roger Zieg

Roger has done electrical work in areas including construction, residential, agricultural, commercial, and industrial settings. Before joining the Lewellyn Team, Roger had worked for C & S Products, Kellogg Cereals, Cargill, The City of Manson, Iowa, The City of Council Bluffs, Iowa, and Davis International. Roger has taught electrical classes for Iowa Central Community College, Western Iowa Tech Community College and Metro Community College in Omaha, Nebraska