

# IDENTIFYING UNMARKED LEADS OF A NINE LEAD WYE CONNECTED MOTOR

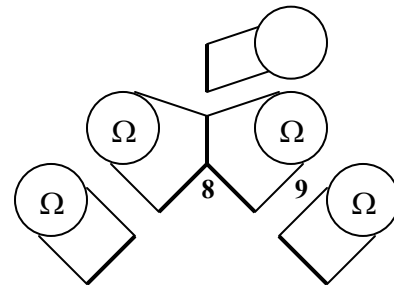
This paper contains information that has been “out there” for a number of years and has been tested by many in an effort to safely identify the unmarked leads of nine lead wye connected motors.

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.

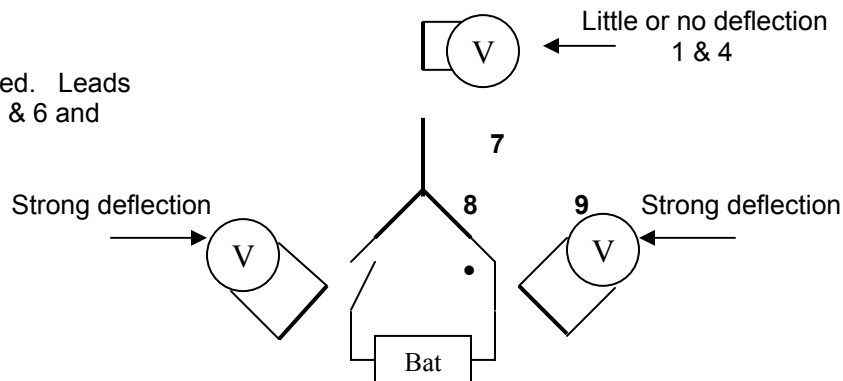
Equipment needed: Test light or ohmmeter, a 6 or 12 volt battery, low scale analog voltmeter and numbered labels. It is important that the motor be assembled, with the leads available at the junction box. The rotor is needed to complete the magnetic circuit. The magnitude of deflection of the voltmeter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

**Note: When a downscale deflection of the voltmeter needle occurs, reverse the voltmeter leads.**

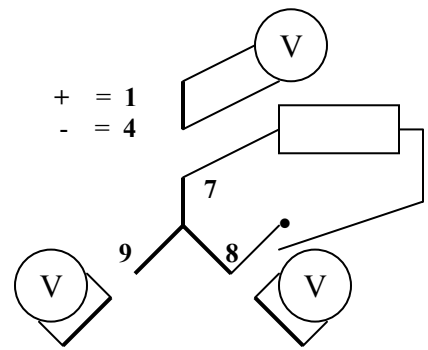
The 9 lead wye connected motor will have four circuits. Three of the circuits will have 2 leads and one circuit will have 3 leads. Identify the three sets of two and the one set of three using the test light or ohmmeter. Label the set of three – 7,8, and 9.



To locate leads 1 & 4, “flash” 8 & 9 as illustrated. Leads 1 & 4 will show little or no deflection. Leads 3 & 6 and leads 2 & 5 will show strong deflections.



To identify 1 & 4, connect the + (positive) terminal of the battery to 7. The – (negative) terminal of the battery will be “flashed” to 8. Connect the voltmeter to 1 & 4. If there is an upscale deflection, the +(positive) lead of the voltmeter will be on 1 and the –(negative) lead of the voltmeter will be on 4. 1 & 4 can now be labeled.



Little or no deflection

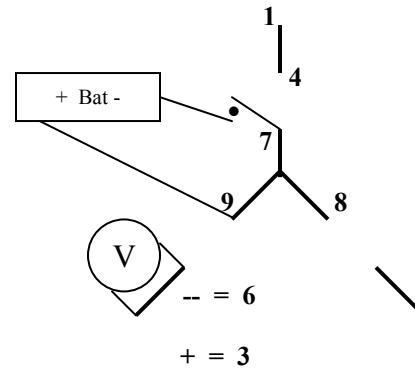
Strong deflection

3 & 6

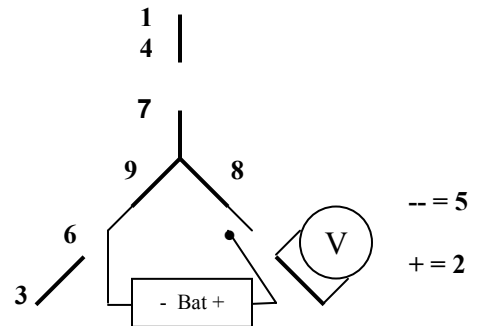
2 & 5

To locate leads 3 & 6. Keep the battery connections in place, and “flash” 8 as above. 3 & 6 will show little of no deflection. 2 & 5 will show a strong deflection.

To identify 3 & 6, connect the voltmeter to 3 & 6. Connect the – (negative) terminal of the battery to 7. The + (positive) terminal of the battery will be “flashed” to 9. If there is an upscale deflection of the voltmeter, the + (positive) lead of the voltmeter will be on 3 and the – (negative) lead of the voltmeter will be on 6. 3 & 6 can now be labeled.



All that is left is to identify leads 2 & 5. Connect the voltmeter to 2 & 5. Connect the – (negative) terminal of the battery to 9. The + (positive) terminal of the battery will be “flashed” to 8. If there is an upscale deflection of the voltmeter, the + (positive) lead will be on 2 and – (negative) lead will be on 5. 2 & 5 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