

**BULLETIN NO. 12/13-010****DATE: 14 JAN 13****TO: ALL ISR AFFILIATES****SUBJECT: FUEL TESTING PROCEDURES****DIGITRON FUEL METER TEST PROCEDURE**

The Digitron tester is designed to detect the addition of oxidizers to a gas/oil fuel mixture. This is done by comparing the resistance and the dielectric constant of a competitor's fuel to that of a known base. Fuel with oxidizers added (such as methanol, nitro, etc.) will cause the instrument to register more positive than the base. This indicates some type of additive in the competitor's fuel.

To test fuel with the Digitron meter, proceed as follows:

1. Use a fresh, clean supply of cyclohexane (C<sub>6</sub>H<sub>12</sub>) as the base fluid.
  2. Make certain that the cyclohexane and the fuel sample to be tested are at the same temperature. A variance of only 5° F between fluids will produce incorrect readings. Before disqualifying for fuel, adjust the temperature of both fluids to 60° F and retest. This is the standard calibration temperature for testing with this meter.
  3. Insert sensor into cyclohexane and adjust instrument to read -55 (-55 reading is used to allow for minor variations in gasoline). The -55 reading is used as the "zero (0) adjustment" in testing.
- A. TESTING CLASSES WHERE ETHANOL IS NOT ALLOWED IN FUEL.
1. Insert Digitron sensor into the fuel sample. Meter reading must fall between -30 and -75. If the meter reading falls outside these parameters, fuel fails and no further tests are necessary.
  2. If fuel falls between -30 and -75 on the meter, place a fuel sample in a test tube and drop a few drops (3 to 5) of ceric acid into the test tube sample. Shake the test tube. If the sample turns any color other than yellow, the fuel fails and no further tests are necessary.
  3. If this fuel sample turns yellow, place a new sample of fuel into a test tube and drop a few drops (1 or 2) of Reagent-D along the side of the test tube into the fuel. Wait 3 minutes. If a reaction occurs (white color / fungus along the side of the test tube where the Reagent-D ran down the side of the test tube) the fuel fails and is not allowed in competition.
  4. If no reaction to Reagent-D, fuel is allowed in competition.

B. TESTING CLASSES WHERE EHTANOL IS ALLOWED.

1. Insert Digitron sensor into the fuel sample. Meter reading must fall between -29 to +100. If outside these parameters, the fuel fails. No further tests are necessary.
  2. If the fuel falls between -29 to +100 on the meter, place a new fuel sample into a test tube and drop a few drops (3 to 5) of ceric acid into the test tube sample. Shake the test tube. If the sample turns any color other than red, fuel fails and no further tests are necessary.
  3. If this fuel sample turns red, place a given amount of water into a Water Solubility Test Tube Record the amount of water. Pour in a given amount of fuel. Shake the sample and let it settle. If the increase in water and ethanol mix is less than 4%, the fuel fails and no further tests are necessary.
  4. If the increase in the water and ethanol mix is 4% to 10%, place a new fuel sample into a test tube and drop a few drops (1 or 2) of Reagent-D along the side of the test tube into the fuel. Wait three minutes. If a reaction occurs (white color / fungus along the side of the test tube where the Reagent-D ran down the side of the test tube) the fuel fails and is not allowed in competition.
  5. If no reaction to Reagent-D, fuel is allowed in competition.
- C. A competitor may be using a non ethanol fuel in an ethanol allowed class. In that case, use test procedure A where no ethanol is allowed.
- D. Check with the affiliate race organization which classes are allowed to use ethanol and which classes are not allowed to use ethanol.