CP7672 GENERAL PURPOSE DIGITAL MULTITESTER INSTRUCTION MANUAL

SAFETY GUIDELINES

Your Digital Multitester is designed for both home and automotive use. The following Safety Guidelines are provided when it is used for engine or vehicle testing. To prevent accidents that could result in serious injury and/or damage to your vehicle or test equipment, carefully follow these safety rules and test procedures.

SAFETY EQUIPMENT

Fire Extinguisher
Never work on your car without having a suitable fire extinguisher handy. A 5-lb or larger CO_2 or dry chemical unit specified for gasoline/chemical/electrical fires is recommended.

Fireproof Container
Rags and flammable liquids should be stored only in fireproof, closed metal containers. A gasoline-soaked rag should be allowed to dry thoroughly outdoors before being discarded.

Safety Goggles
We recommend wearing safety goggles when working on your car, to protect your eyes from battery acid, gasoline, and dust and dirt flying off moving engine parts.

NOTE: Never look directly into the carburetor throat while the engine is cranking or running, as sudden backfire can cause burns.

LOOSE CLOTHING AND LONG HAIR (MOVING PARTS)
Be very careful not to get your hands, hair or clothes near any moving parts such as fan blades, belts and pulleys or throttle and transmission linkages. Never wear neckties or loose clothing when working on your car.

JEWELRY
Never wear wrist watches, rings or other jewelry when working on your car. You'll avoid the possibility of catching them on moving parts or causing an electrical short circuit which could shock or burn you.

VENTILATION
The carbon monoxide in exhaust gas is highly toxic. To avoid asphyxiation, always operate vehicle in a well-ventilated area. If vehicle is in an enclosed area, exhaust should be routed directly to the outside via leakproof exhaust hose.

SETTING THE BRAKE
Make sure that your car is in **Park** or **Neutral**, and that the **parking brake is firmly set.**

NOTE: Some vehicles have an automatic release on the parking brake when the gear shift lever is removed from the PARK position. This feature must be disabled when it is necessary (for testing) to have the parking brake engaged when in the DRIVE position. Refer to your vehicle service manual for more information.

HOT SURFACES
Avoid contact with hot surfaces such as exhaust manifolds and pipes, mufflers (catalytic converters), radiator and hoses. Never remove the radiator cap while the engine is hot, as escaping coolant under pressure may seriously burn you.

SMOKING AND OPEN FLAMES
Never smoke while working on your car. Gasoline vapor is highly flammable, and the gas formed in a charging battery is explosive.

BATTERY
Do not lay tools or equipment on the battery. Accidentally grounding the "HOT" battery terminal can shock or burn you and damage wiring, the battery or your tools and testers. Be careful of contact with battery acid. It can burn holes in your clothing and burn your skin or eyes.
When operating any test instrument from an auxiliary battery, connect a jumper wire between the negative terminal of the auxiliary battery and ground on the vehicle under test. When working in a garage or other enclosed area, auxiliary battery should be located at least 18 inches above the floor to minimize the possibility of igniting gasoline vapors

HIGH VOLTAGE
High voltage – 30,000 to 50,000 volts – is present in the ignition coil, distributor cap, ignition wires and spark plugs. When handling ignition wires while the engine is running, use insulated pliers to avoid a shock. While not lethal, a shock may cause you to jerk involuntarily and hurt yourself.

JACK
The jack supplied with the vehicle should be used only for changing wheels. Never crawl under car or run engine while vehicle is on a jack.

DESCRIPTION AND SPECIFICATIONS:

DESCRIPTION: This Digital Multitester is a compact, hand-held, easy to use instrument compatible both with home electrical applications, as well as the electrical systems used in modern passenger cars and trucks. It may also be used to measure voltages in the computer control circuits of computer-controlled vehicles.

SPECIFICATIONS:

Display – 3 1/2 digit, .5 inch LCD (Liquid Crystal Display)

Automatic Polarity Sensing – Display shows a minus (-) sign on the DC Volts and Amps functions when lead hookup is reversed.

Zero adjustment – Unit automatically zeroes on the volts and Amps functions.

Over range indication – Left side of display shows either "1" or "-1" when range in a function is exceeded.

Operating temperature – 0°C - 35°C (32°F - 95°F), 0-80% R.H.; 35°C - 50°C (95°F - 122°F), 0-70% R.H.

Measurement rate – 2.5 measurements per second, nominal

Power – Nine (9) volt alkaline or carbon zinc battery, NEDA 1604

Accessories – Test leads (pair), instruction manual

FUNCTIONS AND DISPLAY:

The analyzer provides the following functions and displays them as indicated.

OFF - To preserve battery life always return the rotary switch to OFF when testing is complete.

Accuracies are ± (% reading + No. of digits) at 23°C ± 5°C (75°F ± 9°F), less than 75% R.H.

AC Volts

Range	Resolution	Accuracy (45Hz-450Hz)	Overvoltage Protection
200V	100mV	± (1.2% rdg + 10 dgts)	DC 1000V
750V	1V		AC 750V

DC Volts

Range	Resolution	Accuracy	Overvoltage Protection
200mV	100µV	± (0.25% rdg + 2 dgts)	DC 500V AC 220V
2000mV	1mV	± (0.5% rdg + 2 dgts)	
20V	10mV		DC 1000V
200V	100mV		AC 750V
1000V	1V		

DC Current

Range	Resolution	Accuracy	Voltage Burden
200µA	0.1µA	± (1% rdg + 2 dgts)	200mV
2000µA	1µA		
20mA	10µA		
200mA	100µA	± (1.2% rdg + 2 dgts)	

Overload protection: mA Input: 200mA/250V fuse

DC 10A

Range	Resolution	Accuracy	Voltage Burden
10A	10mA	± (2% rdg + 2 dgts)	200mV

Overload protection: un-fused up to 10A for 15 seconds

Resistance

Range	Resolution	Accuracy	Max. Open Circuit Voltage
200Ω	0.1Ω	± (0.8% rdg + 2 dgts)	2.8V
2000Ω	1Ω		
20KΩ	10Ω		
200KΩ	100Ω		
2000KΩ	1KΩ	± (1% rdg + 2 dgts)	

Diode Check

Use this test to check for open or shorted diodes.

Transistor Check (hFE)

Use this test to check for open or shorted transistors.

PRECAUTIONS AND PREPARATION FOR MEASUREMENT:

1. Be sure that a fresh nine (9) volt battery is correctly installed in the multitester.
2. Compare the position of the selector switch with the anticipated test result. In the case of voltage or current measurement, always select a range which is high enough to handle the worst case result! Voltage or current may be higher than you expect.
3. The **BLACK** test lead is always inserted in the **COM** (common) jack on the multitester. The **RED** test lead must be inserted in either the **VΩmA** (Volt-ohm-milliAmp) jack or the **10ADC** (Amperes DC) jack, depending on the test being performed. **Incorrect placement of the RED test lead may damage the multitester, the circuit under test, or both!**
4. **The 10 Amp range on the multitester is not fused. Exercise extreme caution!**
5. Operate the multitester only in temperatures between 0°C and 50°C (32°F - 122°F), and at 80% or less relative humidity (RH).
6. Turn the **SELECTOR** switch to the OFF position when testing is completed. If the multitester will not be used for an extended period of time, remove the internal nine (9) volt battery to avoid damage from leakage.
7. Do not store the multitester in direct sunlight, or in areas of high temperature or high humidity.

MEASUREMENT PROCEDURES:

1. VOLTAGE MEASUREMENT

a. Set the **SELECTOR** switch to the **ACV** or **DCV** voltage position.
b. Plug the **BLACK** test lead into the **COM** input jack on the multitester.
c. Plug the **RED** test lead into the **VΩmA** input jack on the multitester.
d. Connect the test leads to the circuit under test, observing proper polarity when measuring DC voltage.
e. Read the result on the digital display. If the display reads over-range (1), switch to a higher range within the **ACV** or **DCV** function.

2. DC MILLIAMP MEASUREMENT

a. Set the **SELECTOR** switch to the **DCA** current position.
b. Plug the **BLACK** test lead into the **COM** input jack on the multitester.
c. Plug the **RED** test lead into the **VΩmA** input jack on the multitester.
d. Connect the test leads to the circuit under test, observing proper polarity.
e. Read the results on the digital display. If the display reads over-range (1), switch to a higher range within the **DCA** function.

3. DC 10 AMPS MEASUREMENT

a. Set the **SELECTOR** switch to the **10 A** current position.
b. Plug the **BLACK** test lead into the **COM** input jack on the multitester.
c. Plug the **RED** test lead into the **10ADC** input jack on the multitester.
d. Connect the test leads to the circuit under test, observing proper polarity.
e. Read the result on the digital display.

4. RESISTANCE MEASUREMENT

a. Set the **SELECTOR** switch to the required resistance Ω (ohms) position.
b. Plug the **BLACK** test lead into the **COM** input jack on the multitester.
c. Plug the **RED** test lead into the **VΩmA** input jack on the multitester.
d. Connect the test leads to the circuit under test.
e. Read the result on the digital display. If the display reads over-range (1), switch to a higher range within the resistance function.

5. DIODE CHECK

a. Set the **SELECTOR** switch to the →|(diode) position.
b. Plug the **BLACK** test lead into the **COM** input jack on the multitester.
c. Plug the **RED** test lead into the **VΩmA** input jack on the multitester.
d. Connect the test leads to the diode under test. The diode must be removed from the circuit to achieve proper results.
e. Read the result on the digital display.
f. Reverse the test lead connections at the diode.
g. Read the result on the digital display.
h. A good diode will show a low reading with the test leads connected one way, and infinity (1) with the test leads connected the other way. The low reading will typically be some three-digit number on the display. The actual number is not critical.

6. TRANSISTOR CHECK

a. Set the **SELECTOR** switch to the **hFE** position.
b. Determine whether the transistor is NPN or PNP type and locate the Emitter, Base, and Collector leads. Insert the leads into the proper holes of the **hFE** socket located on the front of the multitester.
c. The display will show an appropriate value of the transistor hFE measured under the following condition: base current = 10mA, collector-emitter voltage = 2.8V.

FUSE REPLACEMENT:

All milliampere (mA) ranges of this multitester are fuse protected. Should the current exceed 200 mA in any of these ranges, the fuse may open. To maintain safe operation of the multitester, replace it only with a 200 mA, 250 V, 5mm x 20mm fast-acting glass fuse. Replace the fuse as follows:

1. Turn the **SELECTOR** switch **OFF**.
2. Remove the bottom case half.
3. Remove the battery.
4. Using a small blade screwdriver or other suitable tool, gently pry the open fuse out of its holder.
5. Install a new fuse.
6. Reinstall the battery, and bottom case half.

REPLACEMENT PARTS:

The following replacement parts are available for your multitester. Consult your retailer or the manufacturer for assistance.

PART NUMBER	DESCRIPTION
0002-001-2387	Instruction Manual
0044-000-0121	200 mA 250V Fuse
0038-000-3256	Red/Black Test Lead Set

actron®
precision electronic solutions