



# Model 6039 Battery Tester Operator's Manual

## IMPORTANT SAFETY INSTRUCTIONS

1. **SAVE THESE INSTRUCTIONS** This manual contains important safety and operating instructions for the battery tester you have purchased. You may need to refer to these instructions at a later date.
2. **CAUTION** - The electrolyte in automotive starting batteries is sulfuric acid. This acid is capable of causing severe damage to skin, eyes, and clothing. If you come in contact with battery acid:
  1. Remove contaminated clothing and flood skin for at least 10 minutes with clear, cool water.
  2. Eyes: force open and flood with cool running water at least 10 minutes; then see a doctor. Never use eye drops or other medication before seeing a doctor.

While batteries are being charged or tested, an explosive gas mixture forms inside each cell. Some of this gas escapes through the vent holes in the filler caps and may remain around the battery in an explosive condition. Sparks or flames igniting this gas mixture will burn back through the vent hole and explode inside the battery cell. Such an explosion is dangerous not only because of its own force but also because of the acid electrolyte which would spray over anything in the vicinity.

### To Prevent Explosions:

1. Use well ventilated area for charging and testing batteries.
  2. Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. This helps purge excessive gas from cells. Do not overfill. For a battery without cell caps, carefully follow manufacturer's instructions.
  3. Allow no smoking, sparks or open flames near batteries being charged or tested, or those recently charged or tested.
3. **WARNING - RISK OF EXPLOSIVE GASES.**
    - a. WORKING IN VICINITY OF LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPORTANCE THAT EACH TIME BEFORE USING YOUR TESTER, YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.
    - b. To reduce risk of battery explosion, follow these instructions and those published by battery manufacturer and manufacturer of any equipment you intend to use in vicinity of battery. Review cautionary marking on these products and on the engine.
    - c. Do not break live electrical circuits at the terminals of batteries because a spark may occur at that point causing an explosion. Always turn battery chargers or testers OFF before connecting or disconnecting the clamps from the battery terminals.
  4. **PERSONAL PRECAUTIONS**
    - a. Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
    - b. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with cold running water for at least 10 minutes and get medical attention immediately. Never use drops or other medication before seeing a doctor.
    - c. NEVER smoke or allow a spark or flame in vicinity of battery or engine.
    - d. Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short circuit battery or other electrical part that may cause explosion.
    - e. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can produce a short circuit current high enough to weld a ring or the like to metal, causing severe burn.
    - f. Spilled acid: Neutralize with a solution of baking soda (1 pound per gallon of cold water) or household ammonia (1 pint per gallon of cold water).
  5. **PREPARING TO TEST**
    - a. If necessary to remove battery from vehicle to test, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are turned off, so as not to cause an arc.
    - b. Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.

c. Determine cold cranking amp (CCA) rating of battery by referring to car owner's manual or label on battery.

**6. TESTER LOCATION**

- a. Locate tester as far away from battery as DC cables permit.
- b. Never allow battery acid to drip on tester when reading specific gravity or filling battery.
- c. Do not set a battery on top of tester.
- d. Position cables to reduce risk of damage by hood, door, or moving engine parts.
- e. Stay clear of fan blades, belts, pulleys and other parts that can cause injury to persons.

**7. CONNECTION PRECAUTIONS**

- a. Check that the load knob is fully counter clockwise before connecting clamps.
- b. When attaching clamps to battery posts, twist or rock back and forth several times to make a good connection. This tends to keep clamps from slipping off terminals and helps to reduce risk of sparking.

## OPERATING INSTRUCTIONS

**Duty Cycle:** It is difficult to specify a duty cycle on a carbon pile load tester. It will vary greatly with ambient temperature, length of test and load current on battery.

For maximum life, we recommend that the carbon pile never be heated until it is red hot. This can be easily seen by looking in the unit when running a test. A red glow will indicate that the discs are so hot that the binders which hold the carbon granules together are burning and deteriorating. This will lead to a deterioration of the discs, which will be exhibited by the surfaces of the disc turning soft and powdery.

- 1. Visually inspect battery for obvious damage. Do not test battery if posts are loose, case is cracked, or fluid level in cells is below the top of the plates. With "maintenance free" batteries, see manufacturer's instructions for checking water level.  
**Do not test a frozen battery.**
- 2. See connection precautions before connecting or disconnecting clamps prior to test.
- 3. Connect RED clamp to POSITIVE (POS, +, P) battery post and BLACK clamp to NEGATIVE (NEG, -, N) battery post. Rock clamps to be sure of good electrical connection.
- 4. DETERMINE STATE OF CHARGE OF BATTERY.
  - a. Adjust LOAD CONTROL clockwise (CW) to ½ CCA rating for 3 seconds and release. Do not exceed 300 Amps on a 24-Volt battery.
  - b. Determine State of Charge by reading voltmeter and comparing to chart.

6 Volt	12 Volt	24 Volt	% Charge
6.3 or greater	12.6 or greater.	25.2 or greater	100%
6.2 - 6.3	12.4 - 12.6	24.8 - 25.2	75 - 100%
6.1 - 6.2	12.2 - 12.4	24.4 - 24.8	50 - 75%
6.0 - 6.1	12.0 - 12.2	24.0 - 24.4	25 - 50%
5.8 - 6.0	11.7 - 12.0	23.4 - 24.0	0 - 25%
5.8 or less	11.7 or less	23.4 or less	0%

If the state of charge is less than 75%, charge battery and retest.

**8. LOAD TEST:**

**NOTE:** DURING HEATING CAUSED BY A LOAD TEST, THE CARBON PILE MAY EMIT STEAM AND ODORS THAT HAVE BEEN ABSORBED BY THE CARBON DISCS. THIS IS NORMAL.

- a. Adjust LOAD CONTROL knob CW to ½ the amps of the CCA rating of the battery (do not exceed 300 Amps on a 24-Volt battery) under test for 15 seconds. During the 15-second load test, it may be necessary to adjust the load to give the correct current. This is made necessary by the changing voltage of the battery & the change in resistance of the tester.

- b. At 15 seconds, with the ammeter still reading  $\frac{1}{2}$  the amps of the CCA rating, read the voltmeter. Release the LOAD CONTROL knob and be sure that the ammeter returns to zero amps.

c. **Results:**

**MINIMUM ACCEPTABLE VOLTAGE**

6 Volt	12 Volt	24 Volt	Battery Temperature Degrees F.
4.8	9.6	19.2	70
4.7	9.4	18.8	50
4.6	9.2	18.4	35
4.5	9	18.0	25
4.4	8.8	17.6	15
4.3	8.6	17.2	5
4.25	8.5	17.0	0

NOTE: if smoke is emitted from any cell, the battery is defective regardless of meter indication.

- d. If battery is okay, wait 15 seconds and read voltage. Recharge if below 75% state of charge.
- e. To test two, six volt batteries, or two 12-Volt batteries in series, the jumper between the batteries must be removed and each battery tested individually.

**HOW TO DETERMINE CCA OF BATTERY:**

If the CCA of a battery is unknown, it may be determined by a quick test.

- a. Determine the temperature of the battery.
- b. Check the chart in the load test section for minimum acceptable voltage for a battery of the determined temperature.
- c. Apply a load to the battery for 15 seconds while holding the voltage at the minimum acceptable level determined in step b.
- d. At the end of 15 seconds, read the current applied to the battery. Multiply by two to get the CCA rating of the battery.
  - Do not exceed 300 Amps on a 24-Volt battery.

**APPLICATION DATA:**

**9. ALTERNATOR TEST:**

Be sure battery in car tests good. Start engine with tester connected to battery. Allow engine to fast idle approximately one minute to recharge battery. Voltage reading should be between 13.5 and 15.0 volts in most cases. Cold battery and regulator temperatures may make the reading higher.

**10. STARTER CURRENT TEST:**

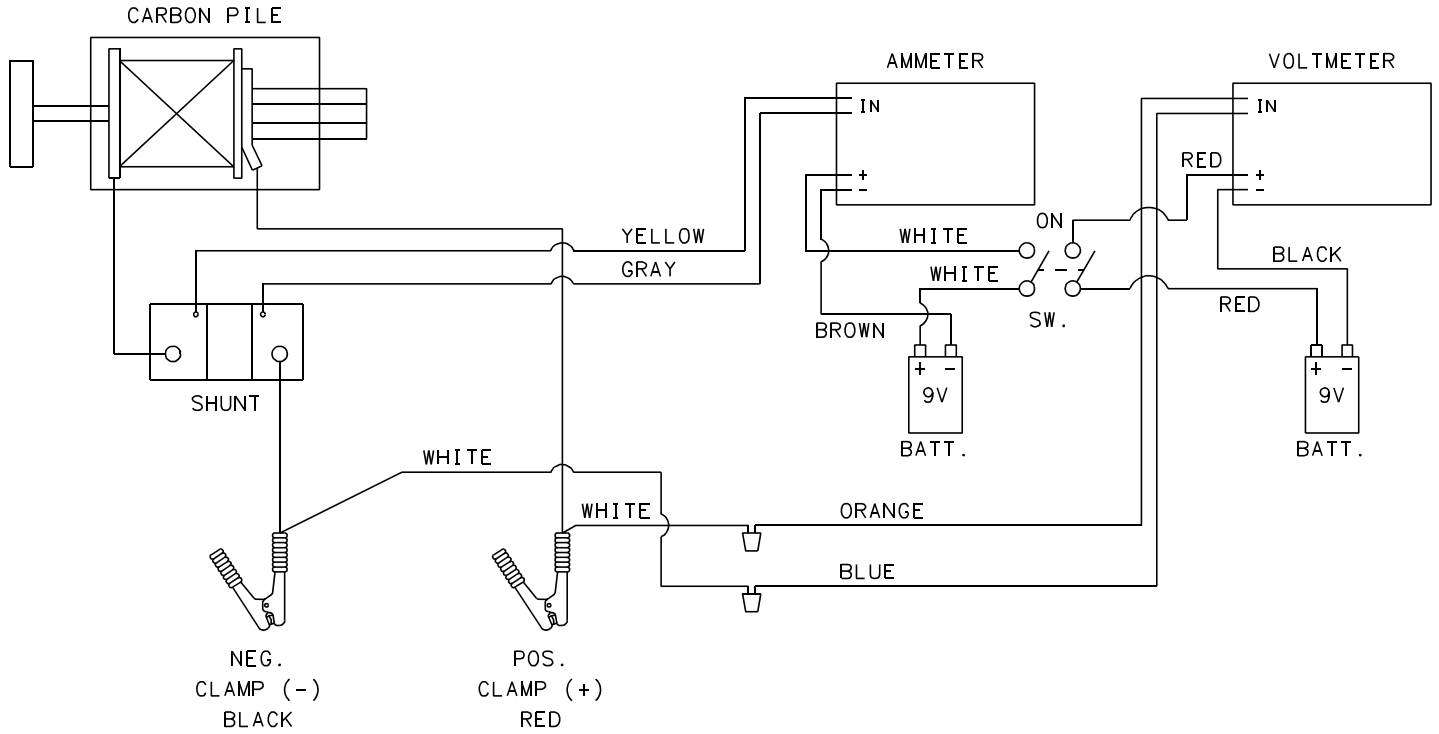
Connect tester to battery. Be sure battery is fully charged. Ground the ignition by removing the coil cable from the distributor cap. Ground the cable to the block with a jumper wire to prevent arcing of the high-voltage spark that could cause a fire, shock you, or damage the ignition system. (On GM cars with HEI ignition, simply disconnect the small lead connected to the BAT terminal on the distributor). Turn ignition switch on and allow starter to turn. Do not crank engine more than 5 seconds. Read the voltage on VOLTS scale while cranking. With automobile circuits OFF and with tester connected to battery terminals, adjust LOAD CONTROL knob to give voltmeter reading the same as measured while cranking engine. Read amps on ammeter. The measured amps is starting current of car.

**11. MAINTENANCE:**

A 9 volt battery provides power for each of the LCD digital meters. To increase battery life, turn the meters off when the tester is not in use.

To replace the instrument batteries, turn the power switch to the OFF position. Remove the two screws on the battery cover in the back of the cabinet. Replace both batteries with fresh alkaline batteries and replace the cover.

# WIRING DIAGRAM



## MODEL 6039 PARTS LIST

Load Knob .....	610809	DC Cables .....	610311
Ammeter .....	610810	Carbon Stack .....	610816
Voltmeter .....	610811	Switch .....	610291
Carbon Pile Assy. ....	610812	Ceramic Tube .....	610817
Handle .....	610813	Battery Holder Assy. ....	610818

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## Revisions

7/96 first printing

10/96 change format of repair part from pn#...description to description...pn#.

11/01 1) Add 24-volt ratings to both tables. 2) Add "Do not exceed 300 amps on a 24-Volt battery" to OPERATING INSTRUCTIONS section 4a, LOAD TEST section a, HOW TO DETERMINE CCA OF BATTERY. 3) Add "or two 12-Volt batteries" to LOAD TEST section e.