



ATD-5495
INSTRUCTION
MANUAL
(12 VOLTS)

AUTOMOBILE
BATTERY
CHARGING SYSTEM
STARTER MOTOR
TESTER



BASIC BATTERY LOAD TEST

(Conventional & Maintenance Free types)

This test evaluates the battery's ability to crank an engine. The tester draws current from the battery while measuring its voltage level. Batteries generate explosive gasses, which can be ignited by a spark or open flame. Work area should be properly ventilated.

Do not lay tester on battery. Do not test frozen batteries.

1. Turn off engine, accessories and battery test equipment.
2. Connect clamps to battery posts (black to negative and red to positive) rock clamps back and forth to insure a good connection.
NOTE: Engine and all electrical accessories must be off when testing battery
3. With clamps connected, testers meter will indicate battery's state of charge. Meter will beep twice, indicating that it is ready to start the test. If state of charge is less than 12 volts, the battery should be recharged before load testing. If recharging does not bring the voltage up to 12 volts, the battery is defective. If the meter needle is off the scale to the left, check for loose or reversed clamps.
4. Press and release red load switch. Tester will beep once indicating that the test has started. Unit will automatically turn the load off after 8 seconds. When test has finished, the tester will beep twice indicating the test is complete.
5. Read meter with load on, and refer to battery analysis chart on page 2.
6. If the tester beeps continuously, it indicates that there is a bad relay in the tester.
7. If the tester beeps continuously after the tester runs the 8-second load test, disconnect clamps immediately, wait two minutes and then repeat test.

NOTE:

The red clamp goes to the positive (+) battery post, and the black clamp goes to the negative (-) battery post. **DO NOT REVERSE CLAMPS.**

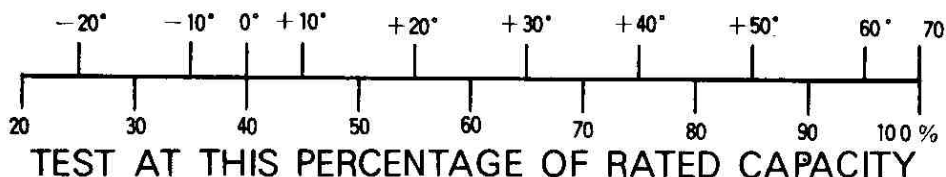
The test will automatically shut off after 8 seconds. When the test is done, the tester will beep twice, indicating that the test is complete.

In order to run a second test on the same battery, disconnect the clamps from the battery posts then reattach clamps. This will reset the unit.

COLD TEMPERATURE EFFECTS

Because of the battery's chemical nature, it will test lower when cold than when warm. For most accurate results, this effect should be compensated for when the battery's internal temperature is below 40° F. Assume internal battery's internal temperature to be the day's high or low average temperature. See chart below.

Example: if rated capacity is 800 CCA and internal temperature is approximately 35° F, assume test capacity to be 560 CCA. (800 CCA x 70% (at 35°) = 560 CCA)



BATTERY ANALYSIS CHART

(Meter reading after load switch has been pressed and completes its load cycle of 8 seconds)

<u>Load Test</u>	<u>Battery Condition</u>
Good (Green)	Battery capacity is O.K. Battery may or may not be fully charged. Check specific gravity of battery to determine state of charge. If specific gravity is less than full charge, check for electrical drain or possible charging system trouble. Recharge battery to full capacity.
Weak or Bad But needle Remains steady (Yellow or Red)	Battery capacity is not satisfactory. battery may be either defective or not fully charged. Check specific gravity to determine which condition exists. If charging does not bring specific gravity to full charge level, battery should be replaced.
Weak or Bad But needle Remains failing (Yellow or Red)	Battery may be defective or very run down. after load has automatically released, note voltage meter reaction. Voltage recovery to 12 volts or above within seconds indicates defective battery. Slow voltage recovery indicates run down condition. For best results, check specific gravity.

STARTER MOTOR TEST

This test identifies excessive starter current draw, which makes starting difficult and shortens battery life. Perform battery load test and proceed only if the battery tests good.

Engine should be at normal operating temperature.

1. Connect clamps to battery posts and run the basic load test (push and release red load test button). Note the exact voltage with the load test on. If voltage continues to fall after 8 seconds, this test will not be available.
2. Apply the voltage obtained above to the starter test table (below).
Use the next to lower minimum cranking volts for engines with less than 300 inches of cubic displacement (CID). For example, if the load voltage is 11 volts, use 10.3 for minimum cranking voltage.

STARTER TEST TABLE

LOAD VOLTS	10.4	10.6	10.8	11.0	11.2	11.4	11.6	11.8
MIN CRANK VOLTS	9.7	10.0	10.3	10.6	10.9	11.2	11.4	11.6

3. Disable the ignition system so the car will not start, crank the engine and note the voltage during cranking.
4. If cranking voltage of step 3 is below the minimum cranking voltage in the starter test table (above), the starter current draw is excessive. If the starter cranks slowly, check for high resistance and poor connection. A meter reading of 9 volts or less indicates excessive current draw. This may be due to bad connections a failing starter motor or the battery is too small for the vehicle" requirements.

M.A.C. TEST (A QUICK CHECK FOR APPROXIMATE STATE OF CHARGE)

M.A.C. = Minutes After Checking (below 30° F, allow two minutes)

Note: If load test is unsatisfactory, refer to the battery analysis chart on page 2.

1. If load test is O.K., leave tester connected and observe meter. If pointer moves to the right of the green area (white charging area) in less than one minute after load test, it indicates a reasonable state of charge.
2. If meter reads within or below the MAC area AFTER one minute, battery has a low state of charge. Check with a hydrometer if possible and recharge as required. Check charging system (refer to page 5) to determine cause of low state of charge.

BAD CELL INDICATORS

1. Gravity varies more than 25 points (0.025 s.g.) from cell to cell. A sign impending, but not immediate failure.
2. Electrolyte fluid appears grey or cloudy or shows suspended particles. A sure indication of age or abuse and approaching end of life.
3. One or more cells are dry while remaining cells show normal electrolyte levels. Not a healthy sign, even though battery may test normally.

CHARGING SYSTEM TEST (Alternator / Generator / Voltage Regulator)

Before running the charging system test, inspect vehicles charging system for low voltage or over-voltage condition, otherwise you could damage the battery.

Alternator/Generator should be at normal operating temperature before running test.

1. Follow steps 1-3 for battery load test.
2. Turn off all electrical accessories and run vehicle at 1500 R.P.M.
3. DO NOT PUSH LOAD SWITCH
4. Note meter reading with all electrical accessories off. One of three conditions will apply:
 - a) Voltage less than 13.5 volts indicates faulty alternator.
 - b) Voltage between 13.5 volts and 15 volts indicates charging system is good.
 - c) Voltage over 15 volts indicates faulty voltage regulator
5. With headlights and blower motor on high, repeat step 4.