# WARRANTY DIAGNOSTIC CHART - HYDROMETER & LOADTESTER

DIXON PREMIUM BATTERIES

## HEALTH AND SAFETY CONTROL


1. Wear acid proofing clothing, rubber gloves and safety glasses.
2. Beware of loose metallic jewellery such as bracelets, necklace which might cause short circuits during testing.
3. Be especially cautious when lifting batteries as electrolyte may leak or be ejected through vent plugs.
4. If electrolyte is spilt onto clothing or the skin it should be neutralised immediately using a solution of baking soda or household ammonia solution and rinse thoroughly with clean water.
5. If electrolyte splashes into the eye, wash thoroughly with cool, clean water.
6. Electrolyte spilt on the surface of the car should be neutralised and thoroughly rinsed with clean water.
7. Batteries expel explosive gases. Keep sparks, flames burning cigarettes or other ignition sources including welding, away from the battery at all times.
8. Battery should be CHARGED in a well ventilated area.
9. Before CHARGING, ensure that the
   a) Charger is off before connecting the leads to the battery
   b) The RED positive (+) lead is connected to the battery positive terminal and BLACK or BLUE negative (-) lead is connected to the battery negative terminal.
10. The battery should not be charged whilst still connected to the vehicle as this can damage the vehicle's electrical system.
11. Ensure that the charger cables or "jump start" leads are in good order and connections are good. A poor connection can cause an electrical arc which can ignite the hydrogen gas and cause an explosion.
12. Avoid dropping tools across the terminals and use of insulated spanners is strongly recommended.
13. Failure to carefully follow the procedure for vehicle "Jump Starting" could result in;
    a) Acid damage due electrolyte spilling through the vents,
    b) Explosion of one of the batteries or,
    c) Damage to the electrical system of one or both vehicles.

## ENVIRONMENTAL CONTROL

1. Inorganic lead and sulphuric acid are the primary components of a battery.
2. These components are hazardous substances, hence batteries that have reached end of life or prematurely failed may be returned to any DIXON BATTERIES outlet for recycling.

## BATTERY CARE AND MAINTENANCE

1. Regularly clean batteries and ensure that they are dry to avoid electrical tracking between posts or tracking down to earth via the battery hold-downs.
2. Regularly check electrolyte level.
3. If the electrolyte level is below or just above the plates, top up with approved battery water.
4. ACID should never be added to battery unless there has been spillage of electrolyte in a fully charged battery.
5. In summary,
   a) A battery must be kept clean.
   b) A battery must be kept fully charged.
   c) A battery must have the electrolyte kept at the correct level.
   d) A battery must not be subjected to excessive shocks or vibrations.

## WARRANTY

**PLEASE REFER www.dixonbatteries.co.za FOR A DETAILED WARRANTY POLICY**

The guarantee does not cover neglect, abuse, overcharging or undercharging due to faulty electrical system. Neither does it cover fitting of a battery below the capacity specified in our official and published recommendation or below the capacity specified by the vehicle manufacturer as original equipment.

The use of battery dopes renders the guarantee null and void. The manufacturer will not be responsible for any consequential damage caused directly or indirectly by a possible failure or defect of the battery.

### STEP I: VISUAL INSPECTION

1. Check warranty date code.
2. Check battery size and application.
3. Check for physical or mechanical damage.
4. Check electrolyte level in all cells.

**REJECT, RETURN TO CUSTOMER**

1. Out of warranty.
2. Wrong application.
3. Physical or mechanical damage.
4. Low electrolyte and sulphation indicating abuse or neglect.

**CLAIM, REPLACE BATTERY**

1. Within warranty.
2. Leaking electrolyte at lid/case seal.
3. Factory or material defects.

### STEP 2: HYDROMETER TESTING

1. Do not add water before testing.
2. Fill hydrometer and tap slightly to ensure float rides free. When electrolyte level is low it may be necessary to tilt the battery in order to fill the hydrometer.
3. Take readings from each cell, returning electrolyte into the cell.
4. The state of charge of the battery shall be determined from

| State of charge | Relative density |
|---|---|
| Flat | Below 1.120 |
| 25% | 1.155 |
| 50% | 1.190 |
| 75% | 1.225 |
| 100% | Above 1.260 |

5. If the relative density is at least 1.225 in all cells, conduct a LOAD TEST as shown in STEP 4.
6. If relative density is below 1.225 in all cells CHARGE battery over night as shown below, STEP 3.

**REJECT, RETURN TO CUSTOMER**

1. Dark, muddy, brown coloured electrolyte in ALL cells indicates overcharging.
2. Dark grey colouration in ALL cells together with high relative density readings. (Acid or battery dopes have been added.)

**CLAIM, REPLACE BATTERY**

1. Dark, muddy, brown coloured electrolyte in 1 or 2 cells.
2. Relative density in 1 or 2 cells varies by more than 50 points when compared with the other cells.
3. Dark grey colouration in 1 or 2 cells.
4. Bad odour (like rotten egg).

NB: Can further be confirmed with the LOAD TEST.

### STEP 3: CHARGE

1. Check and adjust electrolyte level by adding battery water if electrolyte level is below the plates.
2. Connect positive lead of charger to positive battery terminal, negative lead to negative terminal and charge over night.
3. The battery is fully charged if relative density is at least 1.250 and the hourly consecutive relative density readings do not increase by more than 50 points, whilst on charge.
4. After charging, let the battery stand for a period of 12 hours before load testing.

**REJECT, RETURN TO CUSTOMER**

1. Battery does not accept charge.
2. Relative density below 1.225, battery may be severely sulphated or over cycled.

### STEP 4: LOAD TEST

1. Remove all the vent plugs.
2. Ensure Load Tester knob is turned fully anticlockwise.
3. Connect the Load Tester leads to the battery observing the polarity.
4. Record the terminal voltage (no load).
5. Discharge the battery for 10-15 seconds at a current, whose value, in ampere, is equal to at least three times the battery's rated ampere-hour capacity, $C_n$.

668 IEC/SANS (60095 - 1) SAE: CCA: 740 12V | CN: 80Ah | Crn: 135min | Class A

6. Apply the load, by slowly turning the knob clockwise, while observing the voltage drop, until you reach 3 x $C_n$ rating (shown by the red arrow above), on the ampere meter.
7. Record and interpret results as follows;
   a) Battery is in good condition IF initial terminal voltage is at least 12.4V and battery maintains a voltage of at least 9.0V for 10 - 15 seconds during the discharge.
   b) If the load tester drops below 9.0V or one or more cells bubble vigorously, the battery is faulty and should be replaced.

Note:
The procedure may not necessarily apply to all Load testers, hence follow the manufacturer's manual.

**BATTERY OK, CHARGE, RETURN TO CUSTOMER**

1. Initial terminal voltage is at least 12.4V and battery maintains a voltage of at least 9.0V for 10 - 15 seconds during the discharge.
2. Charge, load test and return to customer.

**CLAIM, REPLACE BATTERY**

1. Terminal voltage (no load) is 10.5V or less.
2. Severe gassing in 1 or more cells.
3. Cracking sound in 1 or more cells.
4. Voltage drops below 9.0V within 15 seconds.

## ALTERNATOR VOLTAGE CHECK

1. Fit a fully charge battery in the vehicle.
2. Run engine until working temperature is reached in about 10 minutes.
3. Run the engine at about 1500 - 2000 rpm.
4. Measure the terminal voltage with lights and all electrical accessories turned off. The alternator voltage should range between 14.2 to 14.6V.
5. The battery will be undercharged at alternator below 14.2V.
6. The battery will be overcharged at alternator voltage above 14.6V and consequently an increased rate of water loss.

## NEW BATTERY INSTALLATION

1. On removing the old battery carefully note or mark the positive battery terminal and positive cable, so as to avoid the risk of reversing the polarity on fitting new battery.
2. Remove the NEGATIVE (blue) terminal FIRST, using the correct size spanners.
3. Check for corrosion of battery tray, terminal clamps and damaged cables. Corroded parts should be painted at the earliest convenience.
4. Clean corroded parts and terminals clamps with sodium bicarbonate solution and scrubbing with a stiff bristle brush.
5. Clean battery terminal posts and inside of clamps with sandpaper or wire brush and apply a thin film of mineral grease.
6. Place battery on tray and firmly secure with hold-down clamps.
7. Connect the POSITIVE terminal FIRST
8. Do not over tighten hold-down clamps or terminal connections.
9. Smear terminals with film of mineral grease or petroleum jelly.
10. Check for slack in the alternator belt and ensure it is firmly in the pulley vee.
11. With the engine speed moderately increased, measure alternator voltage at the battery terminals. The voltage should range from 14.2 to 14.6V.

## JUMP STARTING A VEHICLE

1. Connect one end of the POSITIVE (RED) jumper cable to the POSITIVE (+) terminal post on the dead battery.
2. Connect the POSITIVE clamp on the other end of the jumper cable to the POSITIVE (+) terminal post on the good starting battery.
3. Connect one end of the NEGATIVE (BLACK) jumper cable clamp to the NEGATIVE (-) terminal on the good battery.
4. Connect the other end of the NEGATIVE jumper cable to a clean, unpainted area on the engine block of the dysfunctional vehicle.
5. Start the disabled vehicle, with the "live vehicle" engine OFF.
6. Disconnect the jumper cables in the REVERSE order, beginning with the NEGATIVE (-) clamp on the ENGINE BLOCK of the disabled vehicle.

**NOTE:**
These instructions do not necessarily apply to all vehicles. When in doubt consult vehicle manual or call approved dealer.

## DISCLAIMER

Please note that whilst every care has been taken to give you this information, Donaventa Holdings, trading as Dixon Batteries and our distributors cannot be held liable for any damage caused to persons, property or vehicles whilst following these procedures.

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