

DYNO EUROPE

Maintenance instructions

GENERAL INFORMATION

Dyno deep cycle batteries are used mainly for applications that draw a relatively low (Up to 25 amps) amount of current for a long time. Unlike other types of batteries, deep cycles can be drained practically to 0% of capacity with a minimum loss of capacity on future cycles. Nevertheless, for a long lifetime, you should prevent discharging below 80% of the capacity. The deep cycle battery does not develop a memory. Deep cycles, although able to provide high current for starting, are not recommended for high-current short-duration applications. Deep cycles are rated in Amp-hours. This refers to the amount of time that the battery will provide a usable current before dropping below a certain voltage. The very heavy wire grids are made out of metallic sponge lead alloy with special formulated lead oxide pasta for superior lifecycles. A multirib flex-sil gummi is used as separator in the Dyno batteries.

FOR A LONG BATTERY LIFE DYNO RECOMMENDS

Good battery maintenance, using the procedures outlined here is the key to maximum performance and a long battery life.

Tools:

Dyno Europe recommends the following basic equipment for use in battery care and maintenance:

- | | |
|---|-------------|
| - Post Cleaner | - Brush |
| - Petroleum Jelly or vaseline for the poles | |
| - Distilled Water | - Voltmeter |
| - Hydrometer | - Wrench |

CAUTION: Battery acid (dilute solution of sulphuric acid and water) is very aggressive, so always wear protective clothing, protective gloves, and goggles protecting the eyes when manipulating the battery.

STORAGE OF THE BATTERIES

Do not storage at to high or to low temperature:

1. Heat – Avoid direct exposure to heat sources, such as radiators or space heaters. Temperatures above 27° C accelerate the battery's self-discharge characteristics.
2. Freezing – Keeping batteries at a high state of charge also prevents freezing. Avoid locations where freezing temperatures are expected.

Procedure:

1. Completely charge the battery before storing.
2. Store the battery in a cool, dry location, protected from the elements.
3. During storage, monitor the specific gravity (flooded batteries) or voltage.
 - Stored batteries should be given a boost charge when they show a 70% charge or less. (See table previous page.)
4. Completely charge the battery before re-activating.
For optimum performance, equalize the batteries (flooded) before putting them back into service. (See Equalizing section)

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INSPECTION OF THE BATTERIES

WARNING: Smoking near batteries can cause heavy explosions
Do not over-tighten terminals.
Over-tightening can result in post breakage, post meltdown or fire.

Only schooled technicians are allowed to do the maintenance of a battery.

1. Check all battery cables and connections.

- Look closely for loose or damaged parts.
Replace any cable that is broken or frayed

2. Any fluids on or around the battery may indicate that electrolyte is spilling, leaching or leaking out.

- Leaking batteries must be replaced.

3. Be sure there is good contact with the terminals. Tighten all wiring connections to the proper specification (see below).

4. Examine the outside appearance of the battery.

- The top of the battery, posts and connections should be free of dirt, fluids and corrosion. (If batteries are dirty, see cleaning section.)
- Look for cracks in the container.

Damaged batteries should be replaced

PROPER TORQUE VALUES FOR THE BATTERY

Flooded

Automotive: 0,575-0,805 kgm

Side: 0,805-1,050 Kgm

Wingnut: 1,100-1,200 Kgm

Stud 1,400-2,750 Kgm

LT: 1,150-1,400 Kgm

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OPEN-CIRCUIT VOLTAGE TESTING

For accurate voltage readings, batteries must remain idle (no charging, no discharging) for at least 6 hours and preferably 24 hours.

1. Disconnect all loads from the batteries.
2. Measure the voltage with a DC voltmeter.
3. Check the state of charge with the table below.
4. Charge the battery if it registers 0-70% charged.

If battery registers below table values, these conditions may exist:

1. The battery has a bad cell.
2. The battery was left discharged too long.

Batteries in these conditions should be taken to a Dyno Europe dealer for further evaluation, or retired from service.

PERCENTAGES OF CHARGE VOLT	SPECIFIC GRAVITY CORRECTED TO 27°C	OPEN-CIRCUIT 6 VOLT	VOLTAGE 12
100	1.278	6.38	12.74
90	1.257	6.32	12.63
80	1.237	6.26	12.51
70	1.217	6.18	12.36
60	1.194	6.13	12.25
50	1.173	6.06	12.10
40	1.147	5.97	11.97
30	1.123	5.92	11.82
20	1.097	5.84	11.66
10	1.072	5.756	11.52

State of charge as related to specific gravity and open-circuit voltage.

SPECIFIC GRAVITY TESTING

(Flooded batteries only)

1. Do not add water prior to testing.
2. Fill and drain the hydrometer 2-4 times before drawing a sample from the battery.
3. Have enough sample of the electrolyte in the hydrometer to completely support the float.
4. Take a reading, record it and return the electrolyte to the cell.
5. Check all cells in the battery, repeating the steps above.
6. Replace vent caps and wipe off any electrolyte that might have been spilled.
7. Correct the readings to 26,6° C:
 - Add .004 to readings for every 5,5°C above 27° C.
 - Subtract .004 for every 5,5°C below 27° C.
8. Check the state of charge using the Table on the next page.

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The readings should be within the factory specification of 1.277+/-0.007. If any specific gravity reading registers low, follow these steps:

1. Check and record voltage level.
2. Put batteries on a complete charge.
3. Take specific gravity readings again.

If any specific gravity reading still registers low, follow these steps:

1. Check voltage level.
2. Perform equalization charge. (See equalizing section.)
3. Take specific gravity readings again.

If any specific gravity reading still registers lower than the factory specification, one or more of these conditions may exist:

Electrolyte was lost due to spillage.

1. A weak or bad cell is developing.
2. The battery is old and nearing end of life.
3. The battery was left discharged too long.
4. The battery was over-watered prior to testing. Batteries in conditions 1-4 should be taken to a specialist for further evaluation, or retired from service.

ADDING WATER TO THE BATTERY

(Flooded batteries only)

CAUTION : The electrolyte is a solution of acid and water, so skin contact should be avoided.

WARNING : Never add acid to a battery.

Water should only be added after fully charging the battery. Prior to charging, there should be enough water to cover the plates. If the battery has been discharged (partially or fully), the water level should also be above the plates. Check the batteries every month for watering. After a certain time you can see how many water the batteries are consuming and change your control schedule.

Important things to remember:

1. Do not fill the water all the way up to the cap.
2. Do not use water with a high mineral content.
3. Use only distilled or deionised water.
4. Do not allow plates to be exposed to air.

Procedure:

1. Remove the vent caps and check the electrolyte level; the minimum level is to the top of the plates.
2. If there is no electrolyte visible, add just enough water to cover the plates.
3. Replace and tighten all water vent caps.
4. Put batteries on a complete charge before adding any more water.
(See charging section)
5. Once charging is completed, remove the vent caps and check the electrolyte level.
6. Add water until the electrolyte level is 3 mm below the bottom of the fill well.
7. Clean, replace and tighten all vent caps.

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CLEANING THE BATTERY

1. Keep the area around batteries clean and dry.
2. Check that all vent caps are tight;
3. Clean the battery top with a cloth or brush and a solution of baking soda and water.
 - do not allow any cleaning solution or other foreign matter to get inside the battery.
4. Rinse with water and dry with a clean cloth.
5. Clean battery terminals and the inside of cable clamps with a post and clamp cleaner.
6. Reconnect the clamps to the terminals and thinly coat them with petroleum jelly.

CHARGING THE BATTERY

Correctly charging batteries requires administering the right amount of current at the right voltage. Most charging equipment automatically regulates these values. For proper charging, refer to the instructions that came with your charging equipment.

Important items to know:

1. Batteries should be charged after each period of use.
2. Lead-acid batteries do not develop a memory and need not be fully discharged before recharging.
3. Charge only in well-ventilated areas. Keep sparks or flames away from a charging battery.
4. Verify charger voltage settings are correct.
5. Check electrolyte level. (See Watering section)
6. Tighten all vent caps before charging.
7. Do not overcharge or undercharge the batteries.
8. Never charge a frozen battery.
9. Avoid charging at temperatures above 50°C.

Voltage	6volts	12volts	24volts	36volts	48volts
Daily Charge	7,4v	14,8v	29,6v	44,4v	59,2v
Floating	6,6v	13,2v	26,4v	39,6v	52,8v
Equalising	7,8v	15,5v	31v	46,5v	62v

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EQUALIZING THE BATTERY

(Flooded batteries only)

WARNING : Do not equalize Gel batteries.

Equalizing is an overcharge performed on flooded lead-acid batteries after they have been fully charged. It helps eliminate stratification and sulphating, two conditions that can reduce the overall performance of a battery.

Dyno Europe recommends equalizing only when low or wide ranging specific gravity (+/- .015) is detected after fully charging a battery.

Procedure:

1. Verify that batteries are the flooded type.
2. Remove all loads from the batteries.
3. Connect the battery charger.
4. Set charger to equalizing mode.
5. Start charging the batteries.
6. Batteries will begin gassing and bubbling vigorously.
7. Take specific gravity readings every hour.
8. Equalization is complete when specific gravity values no longer rise during the gassing stage.