

OWNER'S MANUAL

ENGINEERED WITH THIN PLATE PURE LEAD (TPPL) TECHNOLOGY

EXTREME POWER AND ENDURANCE



ODYSSEY[®] **BATTERY**

INTRODUCTION

The ODYSSEY® battery ingeniously uses absorbed glass mat (AGM) technology to offer, in one box, the characteristics of two separate batteries. It can deep cycle as well as provide enormous cranking power – it is almost as if a champion long distance runner and a world class sprinter are one and the same person.

These batteries are capable of providing engine cranking pulses in excess of 2700A for 5 seconds as well as 400 charge/discharge cycles to 80% depth of discharge (DOD). A typical starting, lighting and ignition (SLI) battery can do one or the other, but not both. It is either a sprinter or a long distance runner; ODYSSEY batteries will do both – provide short duration high amperage pulse or low rate long duration drains.

In order to achieve the full design cycle life of ODYSSEY batteries in cyclic applications the charge current must be a **minimum of 10% (0.1C₁₀A) of the battery's 10-hour rating (see the column titled "10 Hr Rate-Ah" in the ODYSSEY Range Summary)**. Thus, for example, the minimum charge current for a PC925 battery in a cycling application is 2.7Amps (10% of 27Ah). Please refer to Figure 5 of the ODYSSEY Technical Manual for a detailed discussion of the recommended charge profile for ODYSSEY batteries in cycling applications. The Technical Manual may be downloaded from www.odysseybattery.com.

WHY USE ODYSSEY® BATTERIES?

GUARANTEED LONGER SERVICE LIFE

With an eight to twelve year design life (float) and a three to ten year service life, ODYSSEY batteries save you time and money because you do not have to replace the battery as often. Since actual warranty can vary with your geographical location, please check with your ODYSSEY battery representative for the warranty specific to your application.

SUPERIOR CRANKING AND FAST CHARGE CAPABILITY

The 5 second cranking power of ODYSSEY batteries is double to triple that of equally sized conventional batteries, even when the temperature is as low as -40°C. Also, with simple constant voltage charging (alternator or independent charger), there is no limitation on the inrush current, so the user is assured of fast charge recovery.

MOUNTING FLEXIBILITY

The ODYSSEY battery may be installed in any orientation; except inverted. Acid spillage is negated due to the fully absorbed electrolyte in the AGM material, so it's not free to spill as it is in traditional flooded batteries. The valve regulated design of the ODYSSEY battery removes the need for an acid vent tube; eliminating the fear of acid burns or damage to expensive chrome or paint.

SUPERIOR VIBRATION RESISTANCE

ODYSSEY batteries have passed a variety of rigorous tests that demonstrate their overall ruggedness and exceptional tolerance of mechanical abuse.

READY OUT OF THE BOX

ODYSSEY batteries are shipped fully charged. If the ODYSSEY battery's voltage is 12.65V or greater, simply install the battery in your vehicle and you are ready to go! If below 12.65V, boost charge following the instructions in the ODYSSEY battery Owner's Manual and/or Technical Manual. Putting a boost on the battery will not damage it, even if its voltage reads higher than 12.65V.

WORRY-FREE SHIPPING

Due to the starved electrolyte design, the US Department of Transportation (USDOT) has classified the ODYSSEY battery as nonspillable, so it may be shipped worry-free by express service or by air. Please see our "Information for the Safe Handling of Lead Acid Batteries" at www.enersys.com (for the EMEA region) or our SDS at www.odysseybattery.com (for the rest of the world) for complete details.

LONGER STORAGE LIFE

Unlike conventional batteries that require a recharge every six to twelve weeks, the ODYSSEY battery can be stored for up to two years at 25°C from a fully charged state. These batteries can be stored for two years or when the open circuit voltage (OCV) drops to 12.60V (2.10Vpc), whichever comes first.

DEEP DISCHARGE RECOVERY

Should the ODYSSEY battery become deeply discharged, simply recharge following instructions in this manual.

INSTALLATION

Your ODYSSEY® battery is normally ready to install right out of the box! Measure the battery voltage; if it is 12.65 volts or greater, install; if less, then refer to the Charging section of this manual.

ANY OF THE FOLLOWING WILL VOID THE WARRANTY OF YOUR ODYSSEY BATTERY:

- REMOVING THE LABELED COVER
- REMOVING OR DESTROYING THE BATTERY'S DATE CODE

ODYSSEY EXTREME SERIES™ BATTERY WARNING – DO NOT USE ANY TYPE OF OIL, ORGANIC SOLVENT, ALCOHOL, DETERGENT, STRONG ACIDS, STRONG ALKALIS, PETROLEUM-BASED SOLVENT OR AMMONIA SOLUTION TO CLEAN THE BATTERY COVERS AND BATTERY TOPS. THESE MATERIALS MAY CAUSE PERMANENT DAMAGE TO THE BATTERY COVERS AND BATTERY TOPS AND WILL VOID THE WARRANTY.

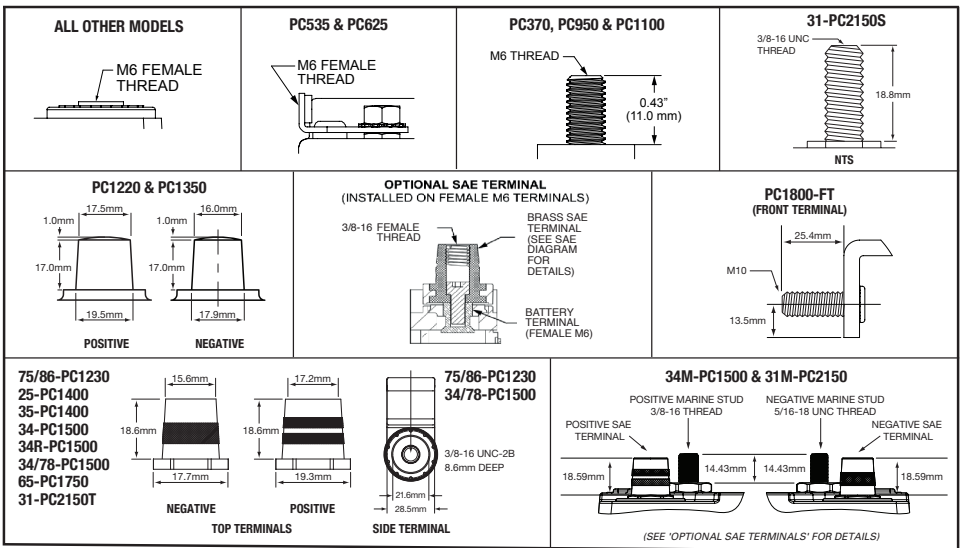
ODYSSEY PERFORMANCE SERIES™ BATTERY WARNING – PROLONGED EXPOSURE AND OR IMMERSION INTO ANY TYPE OF OIL, ORGANIC SOLVENT, ALCOHOL, DETERGENT, STRONG ACIDS, STRONG ALKALIS, PETROLEUM-BASED SOLVENT OR AMMONIA SOLUTION TO CLEAN THE BATTERY COVERS AND BATTERY TOPS MAY CAUSE PERMANENT DAMAGE TO THE BATTERY COVERS AND BATTERY TOPS AND WILL VOID THE WARRANTY.

For FAQs and troubleshooting, please refer to www.odysseybattery.com.

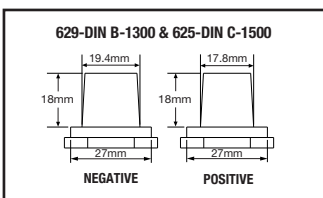
DO NOT SHORT CIRCUIT YOUR ODYSSEY® BATTERY'S TERMINALS!

Remove any metallic items such as watches, bracelets and other personal jewelry to ensure safe installation.

ODYSSEY EXTREME SERIES BATTERIES



ODYSSEY PERFORMANCE SERIES BATTERIES



Note: all illustrations and terminal dimensions are intended for reference only.

INSTALLATION

1. Prior to installation note the date code and serial number needed for warranty registration.
2. Using proper procedures as recommended by the vehicle manufacturer, carefully disconnect the cables from your old battery and remove it from the vehicle. Return the spent battery to the battery dealer for proper recycling.
3. Inspect existing battery cables for corrosion, acid damage or insulation deterioration. Replace if deterioration is present.
4. Position your ODYSSEY battery in the battery holder and fasten firmly to the vehicle.
 - An optional height adapter may be used on 34-PC1500 models for installations where a Group 24 or Group 27 is required. Snap the adapter securely into place on the bottom of the battery. In some installations the 34R-PC1500 model with this adapter may be used to replace a Group 24F or 27F depending on required cable length.
5. Connect the positive cable from your ignition to the Positive (+) terminal.
6. Connect the negative cable from your engine or chassis to the Negative (-) terminal.
7. Torque the bolt, screw or nut per the value stated on the product label. If you're using the optional SAE terminal, hold the brass post with vise grips and counter torque. Do the same with General Motors® automotive battery cable installation.



NOTE: This is a valve regulated sealed battery and never needs to have water or electrolyte (acid) added. Warranty will be void if opened!

SPECIAL NOTICE!

- CUSTOM V-TWIN MOTORCYCLE INSTALLATIONS USING ODYSSEY PC535, PC545, PC545MJ, PC680MJ & PC925LMJ BATTERIES

If your V-Twin motorcycle is equipped with a standard 32 Amp single phase stator/alternator and you ride at a low engine rpm around town or even on long rides, the appropriate ODYSSEY® battery may run out of charge due to low amperage output of the bike’s stator at low rpms. After riding, turn the bike’s engine off but leave the lights on for 30 seconds. Then, turn everything off and connect to a suitable charger.

- Prolonged storage of vehicles with fuel injection computers, alarms, GPS and other electrical devices that require continuous battery power to support active memories; this power drain must be offset with a maintenance-float charger, periodic charging or disconnecting the battery to prevent the establishment of irreversible crystallized sulphation in the battery plate oxide. Failure to address this destroys battery capacity and voids the warranty, as this is not a warranted defect in materials or workmanship.

ODYSSEY® BATTERY STORAGE AND DEEP DISCHARGE RECOVERY

Figure 1 shows the relationship between open circuit voltage (OCV) and state of charge (SOC) for the ODYSSEY battery.

(A) How do I know the state of charge of the battery?

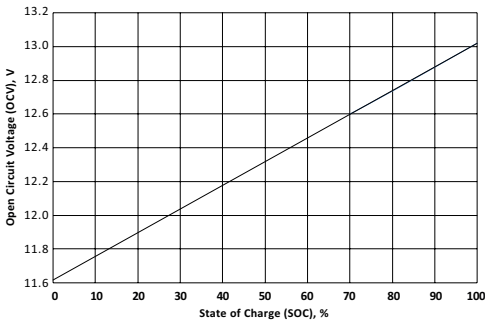


Figure 1: ODYSSEY Battery OCV vs. SOC

As long as the battery has not been charged or discharged for at least 12 hours, Figure 1 can be used to determine the SOC of the ODYSSEY battery. Use a high quality digital voltmeter to measure its OCV. The graph shows that a healthy, fully charged ODYSSEY battery will have an OCV of 12.84V or higher at 25°C.

ODYSSEY batteries should be fully charged prior to storage. Fully charged ODYSSEY batteries can be stored for up to 24 months at 25°C. Battery voltage naturally decreases with time and with increased temperature. The battery voltage should be checked periodically. If the battery voltage drops to 12.60V (2.10Vpc) it should be recharged immediately to avoid permanent battery damage. The following graph can be used as a rough approximation for the potential storage times at different temperatures.

Storage Temperature	Storage Time (Months)
41°F (5°C)	48
59°F (15°C)	36
77°F (25°C)	24
95°F (35°C)	12
113°F (45°C)	6

Table 1: ODYSSEY® battery storage time at temperatures

MAINTENANCE

ODYSSEY® batteries are very different from standard liquid-acid batteries that are openly vented. The ODYSSEY battery is and operates as a sealed battery, recycling nearly all gases internally under normal operating conditions. There is no corrosion of the positive terminal or corrosion to the surrounding area. ODYSSEY batteries are shipped fully charged from the factory, but prior to installation, check the battery's voltage to confirm it is 12.65 volts or greater. If not, recharge it using the procedure below.

Do not charge in an air tight compartment

Never attempt to remove the top decal cover, as it will cause the battery to fail.

CHARGING

The SOC of an ODYSSEY battery can be determined from the following chart:

Voltmeter Reading	State of Charge
13.00 Volts or higher	100%
12.67 Volts	75%
12.31 Volts	50%
11.98 Volts	25%

To prolong the life of the ODYSSEY battery, it is important that the battery is kept near full charge, approximately 12.8 volts. If there are electrical loads connected during storage, then the negative battery cable should be disconnected or an independent float charger used. Low power float/maintenance chargers will keep a fully charged battery fully charged but cannot recharge it if the ODYSSEY battery becomes discharged.

Racing Vehicles using total loss (no alternator) - standard automotive type chargers are not designed to return the necessary amount of energy as needed by ODYSSEY batteries. They normally boost charge to 80-95% and expect the alternator to complete the charge. EnerSys® approved Odyssey Battery chargers provide 105-108% recharge before switching to storage charge.

To fully charge a 31-PC2150 battery that is routinely discharged deeply, a minimum of 10 Amps ($0.1C_{10}A$) are required with charger voltage within the range of 14.4V to 14.8V @ 25°C. It is imperative not to exceed 15.0V as this will cause the pressure valves to open and out-gas hydrogen, oxygen and water from inside the battery. This will shorten the life of the battery and cause premature failure. Some portable chargers exceed 15.0V, especially two-wheel garage chargers, so charging voltages should be verified by measuring the charging voltage during the time when the charging amperage is reducing from full output. The deep cycle charging voltage must be between 14.4V and 14.8V.

If a standard automotive charger is used to boost charge a discharged battery because of an accessory left on, it is important to make sure the charging voltage does not exceed 15 volts during charge. A hand held voltmeter can be used to monitor this periodically.

12V PARALLEL BATTERY CONNECTION

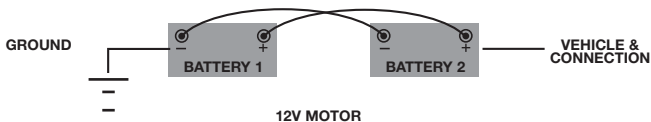


Figure 2: 12V Parallel Battery Connection

24V SERIES BATTERY CONNECTION

To power a 24V system, you will need to connect two ODYSSEY® batteries in series. As shown in Figure 3 below the negative of Battery 1 is wired to the positive of Battery 2.

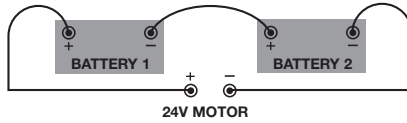


Figure 3: 24V Series Battery Connection

STORAGE

The ODYSSEY battery does not lose its charged energy during cold storage temperatures, so there is no need to trickle or float charge during winter months. To store off-season, measure the battery voltage to make sure it is fully charged, 12.84 volts or greater; recharge if necessary. Disconnect the negative battery cable to prevent any applied electrical load during storage. The ODYSSEY battery cannot freeze down to -40°C , so it can be left in the vehicle. It can be stored for 2 years or more below 25°C . Charging is required at 2 years or 12.6V (2.10Vpc), whichever comes first.

A 12V trickle charger with no more than 2% nominal capacity output can also be left connected to the battery if it is kept in storage for extended periods or if the battery is subject to parasitic loads during storage. The trickle charge voltage measured at the battery terminals must be between 13.5V and 13.8V.

WARRANTY:

EH Europe GmbH ("Manufacturer") warrants its ODYSSEY® batteries (hereafter referred to as "Battery") to be free of defects in material and workmanship for the following Applicable Warranty Periods:

- 2 years for Auxiliary Power Unit (APU) and other non-engine start cycling applications.
- 2 years for power sports applications.
- 3 years for commercial, industrial, marine and automotive applications in non-BCI sizes, and 629-DIN B-1300 and 625-DIN C-1500 in commercial applications.
- 4 years for an engine starting application for PC1220, PC1350, and all BCI sizes.

This warranty may vary from country to country; contact your authorized ODYSSEY® battery wholesaler or dealer for the applicable warranty.

The Applicable Warranty Period begins from the date of purchase with original receipt, or, if no receipt is available, from Manufacturer's shipping date as stated on the battery.

Batteries determined to meet the conditions of this warranty will be replaced free of charge if, at the sole discretion of Manufacturer, adjustment is necessary due to defect in material or workmanship.

The warranty does not cover a Battery reaching its normal end of life which may occur prior to the warranty periods stated above. Depending on the application a Battery can reach its normal end of life before the end of the warranty period. A Battery can deliver only a fixed number of usable amp-hours over its lifetime and is considered to have reached its normal end of life if the application uses up all of these amp-hours, regardless of the time the Battery has been in service. Therefore, the Manufacturer reserves the right to deny a warranty claim if it determines the Battery to be at its normal end of life, even if the claim is lodged within the applicable warranty period.

This warranty does not cover used, pre-owned and/or ODYSSEY battery products purchased through unauthorized Internet channels (for example: auction sites and unauthorized mass e-commerce sellers/resellers).

Batteries for warranty replacement consideration are to be returned to the original supplying distributor/dealer. If not feasible, other ODYSSEY battery distributors/ dealers can be approached but a warranty processing fee may be applied. Reference General Provisions Section B for further details.

GENERAL PROVISIONS:

A. Manufacturer has no obligation under the limited warranty herein in the event the Battery is damaged or destroyed as a result of one or more of the following:

- Willful abuse, misuse, physical damage, neglect or if the top decorative cover has been removed.
- Natural forces such as wind, lightning, hail, damage due to fire, collision, explosion, vandalism, theft, penetration or opening of the Battery case in any manner.
- Overcharging, undercharging, charging or installing in reverse polarity, improper maintenance, allowing the Battery to be deeply discharged via a parasitic load or mishandling of the Battery such as but not limited to using the terminals for lifting or carrying the Battery. Trickle chargers that do not have a regulated trickle charge voltage between 13.5V and 13.8V (no lower than 13.5V and no higher than 13.8V) will cause early failure of the Battery. Use of such chargers with the Battery will also void the Battery's warranty. For applications where an alternator is present, the alternator must deliver between 14.0V and 14.7V when measured at the Battery's terminals. Consult the ODYSSEY® battery technical manual or owner's manual for any necessary temperature compensation. Alternators that do not have a regulated charge between 14.0V and 14.7V (no lower than 14.0V and no higher than 14.7V) will cause early failure of the Battery. Use of such alternators with the Battery will also void the Battery's warranty.
- Failure to properly install the Battery or lack of metal jacket for high temperature or vibration applications.
- Repair or attempted repair of the Battery by anyone other than an authorized Manufacturer's representative shall void this warranty.
- Normal or accelerated deterioration in the electrical qualities due to operating or application conditions.
- If the Battery is used for an application that requires higher cranking power or a greater reserve rating than the Battery is designed to deliver, or the Battery capacity is less than the Battery capacity specified by the vehicle manufacturer, or the Battery is otherwise used in applications for which it was not designed.
- Prolonged storage of vehicles with fuel injection computers, alarms, GPS and other electrical devices that require continuous battery power to support active memories; this power drain must be offset with a maintenance-float charger, periodic charging or disconnecting the Battery to prevent irreversible damage. A Battery with an open circuit voltage (OCV) of equal to or less than 10.0V will be deemed as over discharged and void warranty due to misuse and/or neglect.

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B. TO OBTAIN WARRANTY SERVICE:

1. Retail, Dealer or Wholesaler purchases: return the Battery to the original supplying wholesaler or dealer with original purchase receipt.
2. Online Purchases: For new ODYSSEY battery product purchased through an approved online reseller, contact the original online reseller for warranty service. You may be responsible for shipping, and all associated costs, back to that online reseller. Please check the online reseller's policy before your purchase.
3. www.odysseybattery.com Purchases: contact Manufacturer at your local EnerSys® sales office, which can be found at www.enersys.com. You will need to provide the order number, original date of purchase, serial number, and date stamp from top of the Battery. At the sole discretion of Manufacturer, you may be required to return the Battery for further evaluation and may be subject to additional handling and shipping costs.

If the Battery is determined by Manufacturer, in its sole discretion, to be defective for material or workmanship under terms of this limited warranty, it will be replaced.

Manufacturer's acceptance of any items shipped to Manufacturer shall not be deemed an admission that the items so shipped are defective. Any items shipped back to Manufacturer, shall in Manufacturer's sole discretion, become Manufacturer's property.

TO THE EXTENT PERMITTED BY LAW, THIS LIMITED WARRANTY IS IN LIEU OF AND MANUFACTURER DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, STATUTORY, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN SO FAR AS SUCH WARRANTIES CANNOT BE LAWFULLY DISCLAIMED, MANUFACTURER LIMITS THE DURATION AND REMEDIES OF SUCH WARRANTIES TO THE DURATION AND REMEDIES OF THIS WARRANTY. MANUFACTURER'S EXCLUSIVE LIABILITY FOR BREACH OF WARRANTY SHALL BE TO REPLACE THE BATTERY WITHIN THE EFFECTIVE WARRANTY PERIOD. IN NO EVENT SHALL MANUFACTURER BE LIABLE FOR ANY LOSS OR DAMAGES OF ANY OTHER KIND, WHETHER DIRECT, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, SPECIAL OR OTHERWISE. NOR SHALL MANUFACTURER BE LIABLE FOR ANY REMOVAL OR INSTALLATION EXPENSE, OR THE LOSS OF TIME OR PROFITS.

Some countries and/or states do not allow limitation on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you. This warranty gives you specific legal rights, which may vary from country to country and/or state to state. This warranty shall be governed by and interpreted in accordance with the laws of Switzerland without regard to conflicts of laws rules. The United Nations Convention on Contracts for the International Sale of Goods signed in Vienna in 1980 shall not apply to this warranty. This warranty is understood to be the exclusive agreement between the parties relating to the subject matter hereof. No employee or representative of Manufacturer is authorized to make any warranty in addition to those made in this agreement.

Keep your receipt. Receipt is required for longest Warranty Protection.

For your convenience, this space is provided for attaching your original receipt.

Always properly recycle your lead acid battery by returning to an authorized recycling centre or automotive dealer.



NEVER PLACE USED BATTERIES IN THE BIN!

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