



ODYSSEY™

THE EXTREME BATTERY



OWNER'S MANUAL

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 2250A 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.

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 saves you time and money because you do not have to replace the battery as often. ODYSSEY is warranted against factory defects for two full years in powersports, three full years in automotive, commercial and heavy-duty marine applications and, in the case of the PC1500/34, PC1500/34M, PC1500/34-78, PC1700/65, PC2150/31 and PC2250 batteries, four years in all applications. Since actual warranty can vary with your geographical location, please check with your ODYSSEY 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 (-40°F), -30°C (-22°F) for PC2250. 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) without sacrificing any performance attributes. There is no fear of any acid spillage as ODYSSEY recycles the internal gas during operation or charging. The valve regulated design of the ODYSSEY battery eliminates 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 are of military grade technology and have endured 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 ODYSSEY'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 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

Owing to the drycell design, the US Department of Transportation (USDOT) has classified the ODYSSEY battery as a nonspillable, so it may be shipped worry-free by express service or by air.

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 (77°F) from a fully charged state. These batteries can be stored for two years or when the open circuit voltage (OCV) drops to 12.00V, whichever comes first.

DEEP DISCHARGE RECOVERY

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

INSTALLATION

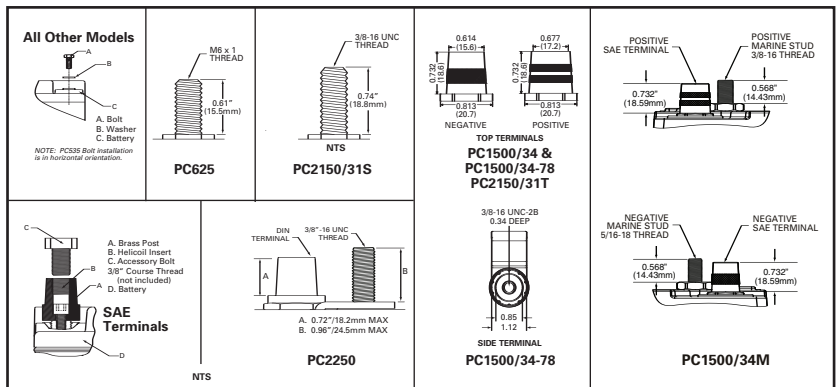
Your ODYSSEY is normally ready to install right out of the box! Measure the battery voltage; if it is 12.65 volts or greater, install; if less, then refer to the charging section.

ANY OF THE FOLLOWING WILL VOID YOUR WARRANTY:

- EXPOSING BATTERY TO GASOLINE OR DIESEL FUEL
- REMOVING THE LABELED COVER
- REMOVING OR DESTROYING THE BATTERY'S DATE CODE

DO NOT SHORT CIRCUIT YOUR ODYSSEY'S TERMINALS!

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



1. 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.
2. Inspect existing battery cables for corrosion, acid damage or insulation deterioration. Replace if deterioration is present.
3. Position your ODYSSEY in the battery holder and fasten firmly to the vehicle.
4. Connect the positive cable from your ignition to the Positive (+) terminal.
5. Connect the negative cable from your engine or chassis to the Negative (-) terminal.
6. Torque the bolt, screw or nut per the specification noted in table. If you're using the Accessory Bolt (C), hold the Brass Post (A) 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!**

Model	Pulse Hot Cranking Amps (5 Sec)	CCA	Length Inches (mm)	Width Inches (mm)	Height Inches (mm)	Weight lbs (kg)	Torque Spec In-lbs (Nm Max)	Internal Resistance (mΩ)	Short Circuit Current	Nominal Constant Current Capacity to 1.67Vpc @ 25°C/77°F - Ah						
										20-Hour	10-Hour	8-Hour	5-Hour	2-Hour	1-Hour	30-Min.
PC310	310	100	5.43 (138.0)	3.39 (86.0)	3.98 (101.0)	5.9 (2.7)	8.9 (1.0)	27.1	455A	8	7	7.6	7.2	6.5	6	5.4
PC535	535	200	6.70 (170.2)	3.90 (99.1)	6.125 (155.6)	12.0 (5.4)	40 (4.5)	8	1000A	14.8	13	14	13	12	11	10
PC545	545	185	7.00 (177.8)	3.37 (85.6)	5.17 (131.3)	12.6 (5.7)	50 (5.6)	10	1200A	14	12	13	13	11	10	9
PC625	625	265	6.70 (170.2)	3.90 (99.1)	6.89 (175.0)	13.2 (6.0)	40 (4.5)	7	1800A	18	17	17	16	15	14	12
PC680	680	220	7.27 (184.7)	3.11 (79.0)	6.67 (169.4)	15.4 (7.0)	50 (5.6)	7	1800A	17	16	16	15	14	13	12
PC925	925	380	6.64 (168.6)	7.05 (179.0)	5.04 (128.0)	26.0 (11.8)	60 (6.8)	5	2400A	28	27	26	25	23	22	20
PC1200	1200	550	7.87 (199.9)	6.66 (169.1)	6.90 (172.7)	38.2 (17.4)	60 (6.8)	4.5	2600A	44	40	40	39	35	32	28
PC1500/34	1500	880	10.85 (275.6)	6.99 (177.5)	7.82 (198.6)	49.5 (22.4)	60 (6.8)	2.5	3100A	68	62	60	57	51	47	42
PC1500/34M	1500	880	10.85 (275.6)	6.99 (177.5)	7.82 (198.6)	49.5 (22.4)	70 (7.9)	2.5	3100A	68	62	60	57	51	47	42
PC1500/34-78	1500	880	10.85 (275.6)	6.99 (177.5)	7.82 (198.6)	49.5 (22.4)	60 (6.8)	2.5	3100A	68	62	60	57	51	47	42
PC1700	1700	875	13.02 (330.7)	6.62 (168.2)	6.93 (176.0)	60.9 (27.6)	60 (6.8)	3.5	3500A	68	65	64	62	58	54	48
PC1700/65	1700	875	11.92 (302.8)	7.17 (182.1)	7.58 (192.5)	60.0 (27.2)	60 (6.8)	3.5	3500A	68	65	64	62	58	54	48
PC2150/31	2150	1150	13.00 (330.2)	6.80 (172.7)	9.41 (239.0)	77.8 (35.3)	150-200 (16.9-22.6)	2.2	5000A	100	92	90	85	80	73	60
PC2250	2250	1225	11.26 (286.0)	10.59 (269.0)	9.17 (233.0)	86.0 (39.0)	100 (11.0) For 3/8" Stud only	2.1	5000A	126	114	110	103	90	80	69

Constant voltage portable charger parameters:

(A) Standby, per 12V battery 13.5-13.8V no current limit required
 (B) Cyclic, per 12V battery (16-hour recharge) 14.4-14.8V no current limit required
 Typical deep-cycle life at 25°C/77°F at a 5-hour rate 400 cycles at 80% DOD
 Typical service life at 25°C/77°F
 Medium to heavy duty usage: 5+ years
 Light duty usage: 5-8+ years

Design characteristics

Battery type Sealed dry cell valve regulated lead acid (VRLA) gas recombination technology
 Plate Design High purity lead/iron grid, starved electrolyte
 Electrolyte/specific gravity Sulfuric acid: 1.310 ±0.005 at 25°C/77°F, fully charged
 Safety Vent Self-sealing Bunsen valve per cell

PULSE DISCHARGE CAPABILITIES

Table 1 shows the 5, 10, 20 and 30-second pulse discharge numbers for these batteries to 7.2V at 25°C (77°F). Sufficient time must be given between successive discharges to allow the terminals to cool down. Also, fully charged batteries will meet these specifications.

Battery	Pulse discharge in amps to 7.2V			
	5 sec.	10 sec.	20 sec.	30 sec.
PC310	310	250	225	200
PC535	535	465	410	380
PC545	545	495	420	380
PC680	680	595	525	400
PC625	625	545	480	450
PC925	925	870	765	675
PC1200	1,200	1,090	900	825
PC1500/34 & PC1500/34M	1,500	1,280	1,100	975
PC1500/34-78				
PC1700 & PC1700/65	1,700	1,540	1,355	1,195
PC2150/31	2,150	1,985	1,750	1,600
PC2250	2,250	2,075	1,775	1,675

Table 1: Pulse discharge of ODYSSEY batteries

ODYSSEY STORAGE AND DEEP DISCHARGE RECOVERY

Figure 2 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?

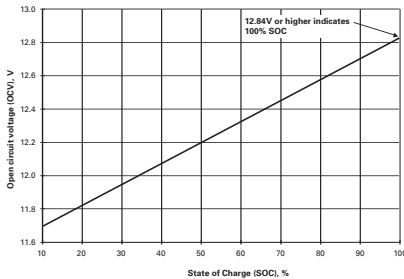


Figure 2: ODYSSEY OCV vs. SOC

As long as the battery has not been charged or discharged for 6 or more hours, Figure 2 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.

(B) How long can the battery be stored?

Refer to Figure 3 below. At 25°C (77°F), these batteries can be stored for up to 2 years. The lower the temperature, the longer the storage time. The battery must be charged before storage.

Roughly every 10°C (18°F) increase in temperature cuts storage time in half. If the temperature rises to 35°C (95°F) the battery may be stored for only 1 year before a recharge becomes necessary. Figure 3 will apply only if the battery is fully charged before storage.

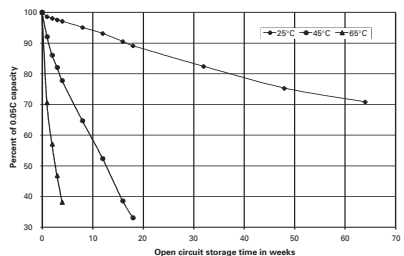


Figure 3: ODYSSEY storage time at temperatures

MAINTENANCE

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

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

CHARGING

The state of charge in an ODYSSEY battery can be determined from the following chart:

Voltmeter Reading	State of Charge
12.84 Volts or higher	100%
12.50 Volts	75%
12.18 Volts	50%
11.88 Volts	25%

Powersport Vehicles - have limited charging systems. To get long life from the ODYSSEY battery, it is important that the battery is kept near full charge, approximately 12.8 volts. If there are electrical loads during storage, then the negative battery cable should be disconnected or an independent float charger used. Low power 2.0 amp chargers for storage charge will keep a fully charged battery fully charged but cannot recharge if ODYSSEY becomes discharged.

Racing Vehicles using total loss (no alternator) - standard automotive type chargers are not designed to return 105-108% of the energy removed. They normally boost charge to 80-95% and expect the alternator to complete the charge. Chargers listed on our website at www.odysseyfactory.com/odycharg_c.htm are specifically designed for ODYSSEY batteries that are routinely deeply discharged. They provide the 105-108% recharge and then switch to storage charge.

To fully charge a PC2150/31, a minimum of 40 amps are required with charger voltage within the range of 14.1V to 14.7V. 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 within 14.1V minimum to 14.7V maximum.

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. The following chart provides recharge times under this type of boost charging to an 80-95% recharge and then allows the vehicle charging system to complete the charge.

ODYSSEY	Charge time for 100% discharged battery (11.5 volts)		
	Model	10-amp charger	20-amp charger
	PC310	48 minutes	24 minutes
	PC535	1½ hours	45 minutes
	PC545	2 hours	45 minutes
	PC625	2 hours	1 hour
	PC680	2 hours	1 hour
	PC925	2½ hours	1¼ hours
	PC1200	4 hours	2 hours
	PC1500/34 & PC1500/34M PC1500/34-78	5 hours	2½ hours
	PC1700 & PC1700/65	7 hours	3½ hours
	PC2150/31	10 hours	5 hours
	PC2250	12 hours	6 hours

WINTER STORAGE

ODYSSEY 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. ODYSSEY cannot freeze down to -40°C (-40°F), -30°C (-22°F) for PC2250, so it can be left in the vehicle. It can be stored for 2 years or more below 77°F.

A 12V, 3 amp trickle charger 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. Information on two such chargers we recommend, including where to buy them, can be found on our website at www.odysseyfactory.com/odycharg_c.htm.

WARRANTY:

EnerSys Energy Products Inc. ("Manufacturer") warrants its ODYSSEY™ batteries to be free of defects in material and workmanship for the earlier of (a) the Applicable Warranty Period or (b) within 400 cycles to 80% depth of discharge, whichever occurs first. The Applicable Warranty Period is two (2) years for power sports applications; three (3) years in automotive, marine, commercial, and industrial applications; and, in the case of the PC1500/34, PC1500/34M, PC1500/34-78, PC1700/65, PC2150/31 and PC2250 batteries, four (4) years in all applications from the date of purchase with original receipt, or, if no receipt is available, from Manufacturer's shipping date. Within the warranty period, the battery will be replaced free of charge if adjustment is necessary due to defect in material or workmanship (not merely discharged). Simply return the battery to any authorized ODYSSEY dealer with the original receipt for a replacement. This warranty may vary from country to country; contact your authorized ODYSSEY wholesaler or dealer for the applicable warranty.

GENERAL PROVISIONS

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

- Willful abuse or 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 Odyssey batteries. Use of such chargers with Odyssey batteries will also void the battery's warranty.
- Failure to properly install the battery or lack of metal jacket for high temperature or vibration applications.
- Normal deterioration in the electrical qualities or the acceleration of such deterioration due to conditions that accelerate such deterioration.
- 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.

B. To obtain warranty service:

1. Return the battery to any authorized ODYSSEY wholesaler or dealer.
2. If the battery is determined to be defective for material or workmanship under terms of this limited warranty, it will be replaced. 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. 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.

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 center or automotive dealer.



NEVER PLACE USED BATTERIES IN YOUR REGULAR TRASH!

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