



Aerospace & Defence

**Deep Discharge
Recovery Procedure
for Aircraft Batteries**

Document No.

9602 – 6298 Rev 01

EnerSys[®]

Power/Full Solutions

1.0 INTRODUCTION

This document covers the deep discharge recover procedure for EnerSys valve regulated aircraft batteries.

2.0 SAFETY ADVICE



Warning!

Short circuit currents will exceed 2000 amps; all tools must be insulated. Care must be taken with all items of metal in clothing and jewellery, e.g. Buckles, zips, rings, watches, chains etc.



Caution!

Always ensure that the battery lid is securely fitted prior to charging.

Monobloc terminal nuts are NOT to be re-tightened.

Note!

- 1) *A dedicated lead acid battery room is not required for servicing. A normal electrical workshop may be used and under certain conditions the battery can be serviced in a nickel cadmium battery room.*
- 2) *Use a Fluke Digital Voltmeter Series 70 or equivalent, to carry out Open Circuit Voltage (OCV) checks.*

3.0 DEEP DISCHARGE RECOVERY PROCEDURE

(Refer to Deep Discharge Recovery Flowchart)

If a battery is heavily discharged, recognised by an OCV of less than 20 volts and usually due to low current drain, it is said to be in a deeply discharged state. The EnerSys battery should recover from deeply discharged state using the recovery procedure detailed below.

- (a.) Discharge the battery at the rate detailed in table 1 at $20 \pm 2^{\circ}\text{C}$ to an end voltage of 12 volts.

Battery Rating	Discharge current
18 Ampere-hour	2.6 Amps
25 Ampere-hour	3.8 Amps
37 Ampere-hour	4.9 Amps
40 Ampere-hour	5.0 Amps

Table 1

(b.) Charge the battery using a **constant current charger** set at the current detailed in table 2 for 15 hours.

Note!

The 15 hours constant current charge may be split into 2 or 3 smaller periods such as 2 by 7.5 hour charge periods or 3 by 5 hour charge periods.

Battery Rating	Charge current
18 Ampere-hour	2.0 Amps
25 Ampere-hour	3.0 Amps
37 Ampere-hour	3.9 Amps
40 Ampere-hour	4.0 Amps

Table 2

Note!

Before the voltage stabilises at around 31V it may rise as high as 35V as the gas recombination process starts. This occurrence is normal and will not degrade the battery.

(c.) Allow the battery to stand battery open circuit at $20 \pm 2^{\circ}\text{C}$ for 16 to 24 hours after constant current charge.

(d.) Discharge the battery at the appropriate rates detailed in table 3 at $20 \pm 2^{\circ}\text{C}$ to an end voltage of 20 volts or 48 minutes whichever is achieved first. Record the terminal voltage at the end of the discharge.

Battery Rating	Discharge current
18 Ampere-hour	18 Amps
25 Ampere-hour	25 Amps
37 Ampere-hour	37 Amps
40 Ampere-hour	40 Amps

Table 3

Note!

Discharge duration should not be allowed to exceed 48 minutes.

(e.) If the discharge duration is in excess of 48 minutes, recharge the battery as detailed in paragraph 4.0. Record the test result on the battery label and return to service.

- (f.) If the discharge duration is less than 48 minutes, recharge the battery in accordance with paragraph 4.0.
- (g.) Allow the battery to stand open circuit for a minimum of 4 hours before repeating steps (a) to (e).
- (h.) If this second discharge duration is still below 48 minutes the battery should be rejected and disposed of in accordance with local regulations.

IT IS STRONGLY RECOMMENDED THAT DEEP DISCHARGES ARE PREVENTED OR KEPT TO A MINIMUM.

4.0 CONSTANT POTENTIAL CHARGING

Note!

CONSTANT POTENTIAL CHARGERS MUST BE CAPABLE OF SUPPLYING A MINIMUM OF 10 AMPS.

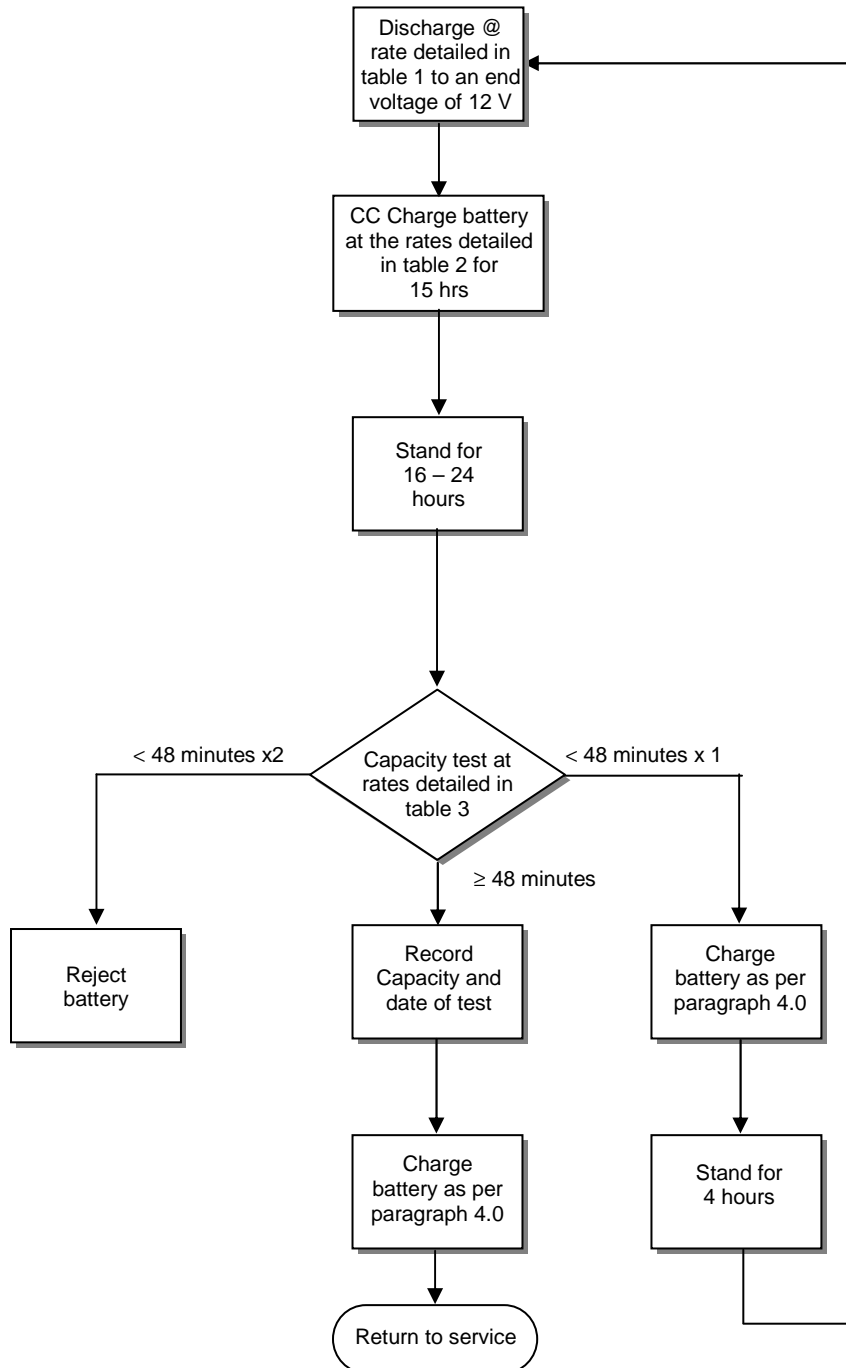
Charge the battery using a constant potential charger capable of supplying 28.0 volts with a current limit set at 10 amps.

The higher the available current the faster the battery will recharge, typical duration values are shown table 4 below: -

Battery Capacity	Charge Duration		
	@ 10 A	@ 20 A	@ 30A
18 Ampere-hour	4	3	2
25 Ampere-hour	6	5	4
37 Ampere-hour	8	7	6
40 Ampere-hour	8	7	6

Table 4

**Appendix 1 -
Deep Discharge Recovery flow chart**



Key:
CC – Constant Current



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