



CONCORDE BATTERY CORPORATION

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TO: HOLDERS OF COMPONENT MAINTENANCE MANUAL
FOR RG-150 SERIES EMERGENCY AIRCRAFT BATTERY (CMM 24-30-27)

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REVISION B DATED MAY 11/2023

HIGHLIGHTS

Changes from the previous revision are highlighted in the following table:

Page(s)	Description of Change	Effectivity
TOC-3	Added Table 103 to List of Tables.	All Models
102	Added 4.C, Refer to Table 103 for discharge rates for capacity tests.	All Models
103	In Table 1, revised Electronic Load capability to go as low as 1.0ADC.	All Models
104	Added Table 103, Discharge Rates for Capacity Testing.	All Models
106	Revised Section 6 (Capacity Test Procedure) based on rates given in Table 103.	All Models
107	Revised Section 8 (Conditioning Charge Procedure), Part A, based on rates given in Table 103.	All Models
601-602	Added instructions for replacement of circuit breaker (CB) on Front Shell assembly.	All Models
901	In Table 901, revised Electronic Load capability to go as low as 1.0ADC.	All Models
1502	Revised Section 7 (Capacity Test Procedure) based on rates given in Table 103.	All Models
1503	Revised Section 8 (Conditioning Charge Procedure), Part A, based on rates given in Table 103.	All Models
1005	Added part numbers of approved circuit breakers to Table 1001.	All Models
1006	Added part numbers of approved circuit breakers to Table 1002.	All Models



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RG-150 SERIES EMERGENCY AIRCRAFT BATTERY

**COMPONENT MAINTENANCE MANUAL
WITH ILLUSTRATED PARTS LIST**

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**THIS CMM IS APPLICABLE TO THE FOLLOWING BATTERY TYPES
AUTHORIZED UNDER TSO-C173A:**

ATA Part Number*	True Part Number*
RG150-1-Y	RG-150-1-Y
RG150-2-Y	RG-150-2-Y
RG150-5-Y	RG-150-5-Y
RG150-6-Y	RG-150-6-Y

*Y = Circuit Breaker Rating in Amps

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RECORD OF REVISIONS

Revision No.	Issue Date	Date Inserted	Inserted By
NC	May 06/2011		
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NOTES:

1. THE LATEST REVISION OF THIS CMM IS AVAILABLE FOR DOWNLOAD FROM CONCORDE'S WEBSITE IN PDF FORMAT. IF YOU ARE UNABLE TO ACCESS THE INTERNET, CONTACT CONCORDE AND A PRINTED COPY WILL BE SENT TO YOU (SEE FRONT PAGE OF THIS CMM FOR WEBSITE AND COMPANY CONTACT INFORMATION).
2. CHANGES FROM THE PREVIOUS REVISION ARE DENOTED BY A VERTICAL LINE IN THE LEFT MARGIN.

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RECORD OF TEMPORARY REVISIONS

Temporary Revision No.	Page Number	Issue Date	By	Date Removed	By

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Record of Revisions	ROR-1	May 11/2023
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Testing and Fault Isolation	101 thru 109	May 11/2023
Schematic and Wiring Diagrams	201 and 205	May 11/2023
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INTRODUCTION

1. Scope and Purpose

- A. This Component Maintenance Manual (CMM) has been prepared in accordance with Air Transportation of America (ATA) Specification 100. It provides instructions for proper storage, servicing, replacement, repair, and disposal of the RG-150 Series of Concorde valve regulated lead-acid emergency aircraft batteries.

2. Application

- A. Batteries covered by this CMM are designed for non-engine starting applications.
- B. This CMM applies to batteries that are in a workshop environment. It does not apply to batteries when they are installed in aircraft.

3. Definitions

- A. Valve regulated lead-acid (VRLA) battery - A lead-acid battery in which there is no free electrolyte and the internal pressure is regulated by a pressure relief valve. This battery requires no maintenance of the liquid level and recombines the gases formed on charge within the battery to reform water. The battery may be used in any attitude without danger of leakage or spilling of electrolyte.
- B. Valve regulated sealed lead-acid (VRSLA) battery - An alternate terminology for a VRLA battery (see definition above).
- C. Rated C1 capacity - The nominal capacity, expressed in Ampere-hours (Ah), obtained from a fully charged battery when discharged at the one hour rate to the specified end point voltage at a temperature of 21 - 25EC (70 - 77EF).
- D. C1 rate - The rate, in amperes, equal to the battery's rated C1 capacity. For example, the C1 rate of a battery rated at 3.5Ah is 3.5 amperes.
- E. End Point Voltage (EPV) - The voltage at which the discharge current is terminated when measuring battery capacity. Unless otherwise stated, the EPV is equal to 20.0 volts.
- F. Open Circuit Voltage (OCV) - The voltage of the battery at rest (no charging or discharging current present). A stable OCV requires a rest of at least four hours.

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4. Safety Precautions

- A. **WARNING: LOW CAPACITY HAZARD.** Aircraft batteries are certified to have a certain minimum capacity for emergency operations in the event of an electrical generator system failure. Never use a battery that has less than 80% of rated capacity and never “jump start” an aircraft that has a “dead” or discharged battery.
- B. **WARNING: ELECTRIC BURN HAZARD.** Lead-acid batteries are capable of delivering high currents if the terminals are shorted. The resulting heat can cause severe burns and is a potential fire hazard. Take the following precautions:
- Do not place tools or metal objects across battery terminals.
 - Do not wear conductive rings, belt buckles, watches or other jewelry when servicing batteries.
 - Wear insulated gloves and use insulated tools when servicing batteries.
 - Install battery terminal protectors whenever the battery is not connected in the aircraft or to the test equipment.
- C. **WARNING: DANGER OF EXPLODING BATTERIES.** Lead-acid batteries can produce explosive mixtures of hydrogen and oxygen while on charge or discharge, which can explode if ignited. Take the following precautions:
- Do not smoke, use an open flame, or cause sparking near a battery.
 - Wear proper eye and face protection when servicing batteries.
 - Make sure work area is well ventilated.
 - Do not constant current charge a battery when installed in an aircraft.
 - Connect cables securely to the battery terminals to avoid arcing.
- D. **WARNING: DANGER OF CHEMICAL BURNS.** Lead-acid batteries contain sulfuric acid which can cause severe burns to body tissue. Take the following precautions:
- Never remove or damage vent valves.
 - Avoid contact of the electrolyte with skin, eyes or clothing.
 - Do not touch eyes after touching battery.
 - In the event of acid in the eyes, flush thoroughly with clean cool water for several minutes and get professional medical attention immediately.
 - Refer to battery MSDS for additional information.
- E. **CAUTION: DANGER OF EQUIPMENT DAMAGE.** To prevent damage to the connector, arc burns, or explosion, batteries should never be connected or disconnected while being charged or discharged. Batteries must be connected or disconnected only when the circuit is open. Ensure the aircraft battery switch, external power source, or the charger/analyzer is in the “OFF” position before connecting or disconnecting the battery. Battery terminal protectors should be installed whenever the battery is not connected in the aircraft or to the test equipment.

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5. Airworthiness Limitations

- A. For batteries covered by TSO-C173A the following limitation applies:
The conditions and tests for TSO approval of this battery are minimum performance standards. Those installing this battery, on or in a specific type or class of aircraft, must determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The article may be installed only according to 14CFR part 43 or the applicable airworthiness requirements. Nickel-cadmium and lead-acid battery safety concerns include the possibility of fire and venting violently.

NOTE: THE AIRWORTHINESS LIMITATIONS SECTION IS FAA APPROVED AND SPECIFIES MAINTENANCE REQUIRED UNDER 14 CFR §§ 43.16 AND 91.403, UNLESS AN ALTERNATIVE PROGRAM HAS BEEN FAA APPROVED.

6. Deviations

- A. None

7. Personnel

- A. Only personnel authorized by the cognizant aviation authority are permitted to service Concorde aircraft batteries. For aircraft registered in the USA, 14CFR Part 43.3 applies.

8. Shop Verification

- A. The following sections of this CMM were verified by actual performance:
Testing and Fault Isolation – verified 4/22/10
Disassembly – verified 4/22/10
Assembly – verified 4/22/10.

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DESCRIPTION AND OPERATION

1. General

A. Cell Construction:

Concorde aircraft batteries are valve-regulated, recombinant gas, absorbed electrolyte, lead acid batteries. The cells are sealed with a pressure relief valve that prevents gases within the battery from escaping. The positive and negative plates are sandwiched between layers of glass mat consisting of glass micro fibers of varying length and diameter. This blend features superior wicking characteristics and promotes maximum retention of the electrolyte. Electrolyte is absorbed and held in place by the capillary action between the fluid and the absorptive glass mat (AGM) fibers. By design, the AGM separator is only about 90-95% saturated with electrolyte. The void space provides the channels by which oxygen travels from the positive to the negative plates during charging. When the oxygen gas reaches the negative plate, it reacts with lead to form lead oxide and water. This reaction at the negative plate suppresses the generation of hydrogen that otherwise would come off the negative plate. In this manner, virtually all of the gas is recombined inside the cell, eliminating the need to add water, resulting in "maintenance free" operation.

B. Grids and Plates:

Each cell of a storage battery has positive and negative plates arranged alternately, insulated from each other by separators. Each plate consists of a framework, called the grid, and a lead paste compound called active material. The grid is cast from a lead alloy. A heavy outside frame adds strength to the plate for good vibration and shock durability. The small horizontal and vertical wires support the active material. These wires also act as conductors for the current. The lead paste compound (active material) is applied to the grid in much the same manner as plaster is applied to a lath wall. A different paste formula is used for the positive and negative plates.

C. Plate Groups:

Plate groups are made by joining a number of similar plates to a common terminal post by means of a plate strap. The capacity of a battery is determined by the number and size of plates in a group. Each plate is made with a lug at the top which is fused to the strap. A positive group consists of a number of positive plates connected to a plate strap and a negative group consists of a number of negative plates connected in the same manner. The two groups meshed together with separators between the positive and negative plates constitute a cell element.

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On discharge, lead dioxide (PbO_2) of the positive electrode and sponge lead (Pb) of the negative electrode are both converted to lead sulfate (PbSO_4) freeing two electrons. On charge, the lead sulfate in the positive electrode is converted to lead dioxide (PbO_2) and the lead sulfate in the negative electrode is converted to sponge lead. The charge process also produces some oxygen at the positive electrode and some hydrogen at the negative electrode. The electrolyte, sulfuric acid (H_2SO_4), is an active component in the reaction at both electrodes.

When flooded (vented) batteries are on charge, the oxygen generated at the positive plates escapes from the cell. Concurrently, at the negative plates, hydrogen is generated from water and escapes from the cell. The overall result is the gassing of the cells and water loss. Therefore, flooded cells require periodic water replenishment.

CAUTION: DO NOT REMOVE THE PRESSURE RELIEF VALVES ON AN RG[®] BATTERY AND DO NOT ADD WATER OR ELECTROLYTE. THE RECOMBINANT GAS DESIGN ELIMINATES THE NEED TO REPLENISH WATER AND ELECTROLYTE. REMOVING THE PRESSURE RELIEF VALVE VOIDS THE WARRANTY.

When valve regulated batteries are on charge, oxygen combines chemically with the lead at the negative plates in the presence of sulfuric acid to form lead sulfate and water. This oxygen recombination suppresses the generation of hydrogen at the negative plates. Overall, there is minimal water loss during charging. A very small quantity of water may be lost as a result of self discharge reactions. However, such loss is so small that no provision need be made for water replenishment. The battery cells have a pressure relief safety valve that may vent if the battery is overcharged.

2. Characteristics of RG-150 Series Batteries

- A. The RG-150 Series of aircraft batteries consist of 12 cells connected in series to make a nominal 24VDC battery. The cells are contained in an aluminum container equipped with an electrical receptacle for mating to the aircraft. In some models, heaters are present to warm the batteries for operation in extreme cold temperature environments. The batteries also contain electronic components which provide isolation of the input charging source and limitation of the charging inrush current. Technical characteristics of the various models are summarized in Tables 1 and 2.

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Table 1. Technical Characteristics of RG-150-1-Y and RG-150-2-Y Batteries

Part Number	RG-150-1-Y*	RG-150-2-Y*
Maximum Weight	14.0 Lbs (6.4 Kg)	
Battery Size	ARINC 404, ¼ ATR Short	
Overall Dimensions	13.83"L x 7.75"H x 2.25"W (351mm x 197mm x 57mm)	
Rated C1 Capacity	3.5 AH	
C1 Capacity, -18EC	3.0 AH	3.3 AH
C1 Capacity, -30EC	2.0 AH	2.9 AH
Input Power	28 VDC Nominal	
Max. Inrush Current	19.5 Amps	
Built In Test Feature	Charge Inhibit Discrete – Disables charging source using 28VDC input to allow battery load test when connected to aircraft equipment.	
Receptacle P/N	DPXBMMA-D8-34P-0107	
Output Circuit Breaker	Available sizes = 1,2,2.5,3,4,5,7.5,10, 15, 20 & 25 Amps	
Internal DC Heater	No	4A Max at 28VDC

*Y = Amp rating of output circuit breaker

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Table 2. Technical Characteristics of RG-150-5-Y and RG-150-6-Y Batteries

Part Number	RG-150-5-Y*	RG-150-6-Y*
Maximum Weight	14.0 Lbs (6.4 Kg)	
Battery Size	ARINC 404, ¼ ATR Short	
Overall Dimensions	13.83"L x 7.75"H x 2.25"W (351mm x 197mm x 57mm)	
Rated C1 Capacity	3.5 AH	
C1 Capacity, -18EC	3.0 AH	3.3 AH
C1 Capacity, -30EC	2.0 AH	2.9 AH
Input Power	28 VDC Nominal	
Max. Inrush Current	19.5 Amps	
Built In Test Feature	Charge Inhibit Discrete – Disables charging source using 28VDC input to allow battery load test when connected to aircraft equipment.	
Receptacle P/N	DPXB-13-34P-0101	
Output Circuit Breaker	Available sizes = 1,2,2.5,3,4,5,7.5,10 & 15 Amps	
Internal DC Heater	No	4A Max at 28VDC

*Y = Amp rating of output circuit breaker

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TESTING AND FAULT ISOLATION

1. Inspection and Replacement Schedule

A. Capacity Checks

1. Operating less than 1000 hours per year:
 - a. Initial check at 12 months.
 - b. As long as capacity is above 90%, subsequent capacity checks every 12 months (± 1 month).
 - c. If capacity is 90% or below and not less than 85%, subsequent checks every 6 months (± 1 month).
 - d. If capacity is less than 85%, remove battery from service.
2. Operating 1000 hours per year or more:
 - a. Initial check at 1000 hours (± 100 hours).
 - b. As long as capacity is above 90%, subsequent capacity checks every 1000 hours.
 - c. If capacity is 90% or below and not less than 85%, subsequent checks every 500 hours (± 100 hours).
 - d. If capacity is less than 85%, remove battery from service.

B. The functionality of the battery's internal charging circuit must be tested each time the battery's capacity is checked.

C. The battery assembly should be replaced after 5 years of service life.

WARNING: CAPACITY CHECKS PROVIDE ASSURANCE OF CONTINUED AIRWORTHINESS OF THE BATTERY. ADJUSTMENTS TO THE FREQUENCY OF CAPACITY CHECKS SHOULD BE BASED ON CAREFUL CONSIDERATION OF FACTORS THAT AFFECT BATTERY LIFE. THESE FACTORS INCLUDE OPERATING PATTERNS, ENVIRONMENTAL CONDITIONS, AND CONFIGURATION OF THE AIRCRAFT ELECTRICAL SYSTEM. IF ANY OF THESE FACTORS CHANGE, THE BATTERY LIFE SHOULD BE RE-ESTABLISHED USING THE ORIGINAL CAPACITY CHECK SCHEDULE.

NOTES:

1. THE CAPACITY CHECK INTERVALS SPECIFIED ABOVE ARE GENERAL RECOMMENDATIONS SUITABLE FOR MOST APPLICATIONS. THE INTERVALS MAY BE ADJUSTED FOR A SPECIFIC AIRCRAFT OR FLEET ONCE THE AVERAGE BATTERY LIFE IS ESTABLISHED.

2. CAPACITY CHECKS ARE OPTIONAL IF THE BATTERY'S FUNCTIONALITY DOES NOT AFFECT AIRWORTHINESS OF THE AIRCRAFT.

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2. Testing Discharged Batteries

- A. If a battery is discharged below the recommended endpoint voltage of 20 volts and is not recharged within 24 hours, it should be subjected to a capacity test to assure airworthiness (see Section 6 of this section).
- B. After the battery is re-installed, the inspection schedule may be adjusted using this new date and equipment flight hours as the starting point for the next capacity check interval.

3. Test Facilities

- A. Concorde valve regulated lead-acid (VRLA) batteries may be serviced in any battery facility, including nickel-cadmium service facilities. VRLA batteries are sealed to prevent cross contamination of the electrolyte.

WARNING: LEAD-ACID BATTERIES CAN PRODUCE EXPLOSIVE MIXTURES OF HYDROGEN AND OXYGEN WHILE BEING CHARGED OR DISCHARGED. NEVER SERVICE BATTERIES IN AN AIRTIGHT OR SEALED ENCLOSURE AND MAKE SURE WORK AREA IS WELL VENTILATED.

4. Tools, Fixtures, Equipment and Consumables

- A. Refer to Table 101 for required test equipment.
- B. Refer to Table 102 for mating connectors.
- C. Refer to Table 103 for discharge rates for capacity tests.

5. Test Set Up

- A. Refer to Figure 101 for testing RG-150-1-Y and RG-150-2-Y batteries.
- B. Refer to Figure 102 for testing RG-150-5-Y and RG-150-6-Y batteries.

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Table 101. List of Test Equipment

Description	Source	Part Number	Purpose
Electronic Load, capable of 1.0 to 3.5ADC constant current with termination at 20 VDC EPV.	Commercially Available	N/A	Capacity Testing
Constant Voltage Power Supply, capable of 28.2 " 0.2 VDC and at least 3.5 ADC output.	Commercially Available	N/A	Constant Potential Charging and Testing Charging Circuit
Constant Current Power Supply, capable of 0.35 to 1.0 " 0.05 ADC and at least 34 VDC output.	Commercially Available	N/A	Constant Current Charging and Testing Charging Circuit
Digital Multimeter (DMM), capable of 0.1 ohms to 1 Megohm with accuracy of 1% or better.	Commercially Available	N/A	Testing Charging Circuit and Measuring OCV
Mating Connector	Commercially Available	See Table 102	Connect Battery to Test Equipment
No. 12 and No. 16 Gauge Socket Probes	Commercially Available	N/A	Connect Battery to Test Equipment (as an alternative to using mating connector)

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR THESE ITEMS.

CAUTION: CONTACT CONCORDE FOR ASSISTANCE WITH SELECTION OF BATTERY CHARGING EQUIPMENT. SOME BRANDS OF BATTERY CHARGERS WILL DAMAGE THE BATTERY.

Table 102. List of Mating Connectors

Battery Type	Battery Receptacle	Mating Connector*
RG-150-1-Y and RG-150-2-Y	DPXBMA-D8-34P-0107	DPXBMA-D8-33S-0007
RG-150-5-Y and RG-150-6-Y	DPXB-13-34P-0101	DPXB-13-33S-0001

***NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR THIS ITEM.**

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Table 103. Discharge Rates for Capacity Testing

Battery P/N	Rated C1 Capacity (Ah)	CB Rating (A)	Test Rate (A)	Equivalent Capacity at Test Rate (Ah)	100% Capacity at Test Rate		90% Capacity at Test Rate		85% Capacity at Test Rate	
					Minutes	Amp-Hour	Minutes	Amp-Hour	Minutes	Amp-Hour
RG-150-1-1 RG-150-2-1 RG-150-5-1 RG-150-6-1	3.5	1.0	1.0	3.97	238	3.97	214	3.57	202	3.37
RG-150-1-2 RG-150-2-2 RG-150-5-2 RG-150-6-2	3.5	2.0	2.0	3.70	111	3.70	100	3.33	94	3.15
RG-150-1-2.5 RG-150-2-2.5 RG-150-5-2.5 RG-150-6-2.5	3.5	2.5	2.5	3.62	87	3.62	78	3.26	74	3.08
RG-150-1-3 RG-150-2-3 RG-150-5-3 RG-150-6-3	3.5	3.0	3.0	3.55	71	3.55	64	3.20	60	3.02
All others	3.5	4.0 & above	3.5	3.50	60	3.50	54	3.15	51	2.98

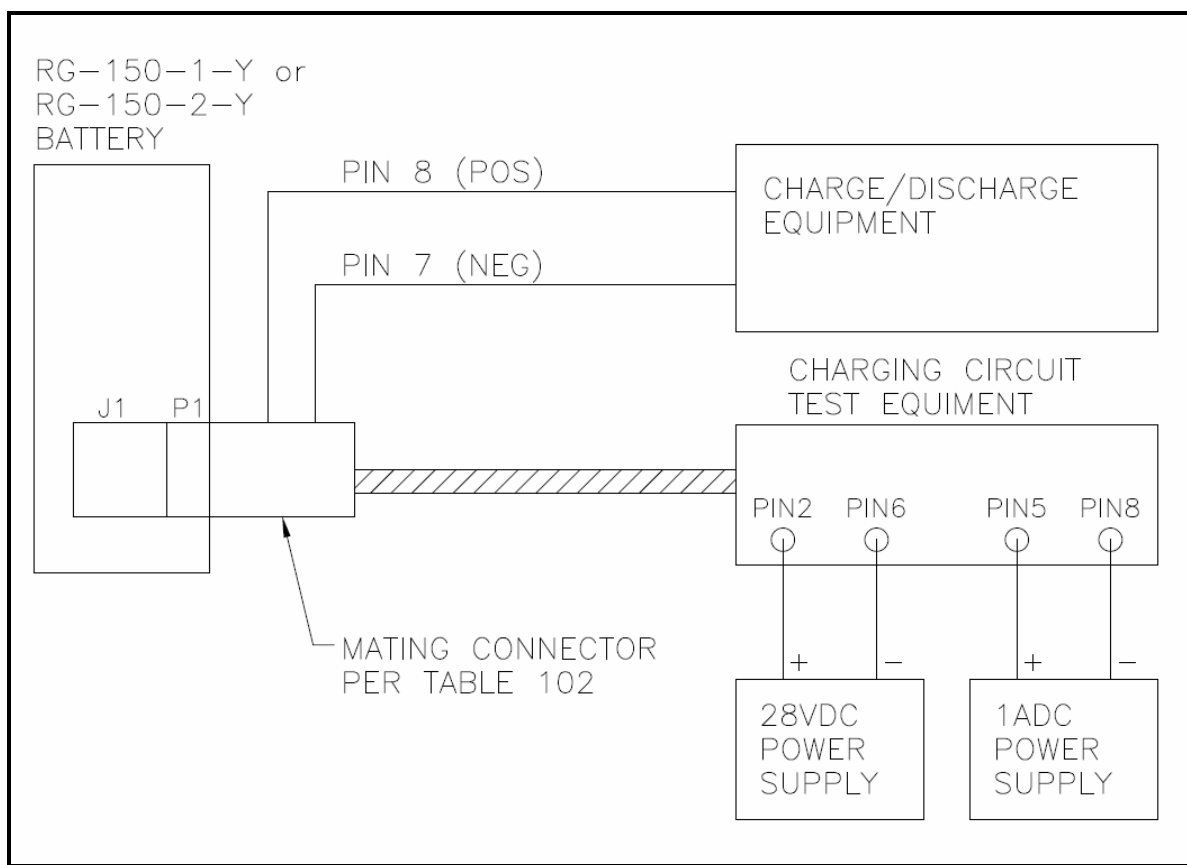


Figure 101. Test Set Up for RG-150-1-Y and RG-150-2-Y Series Batteries

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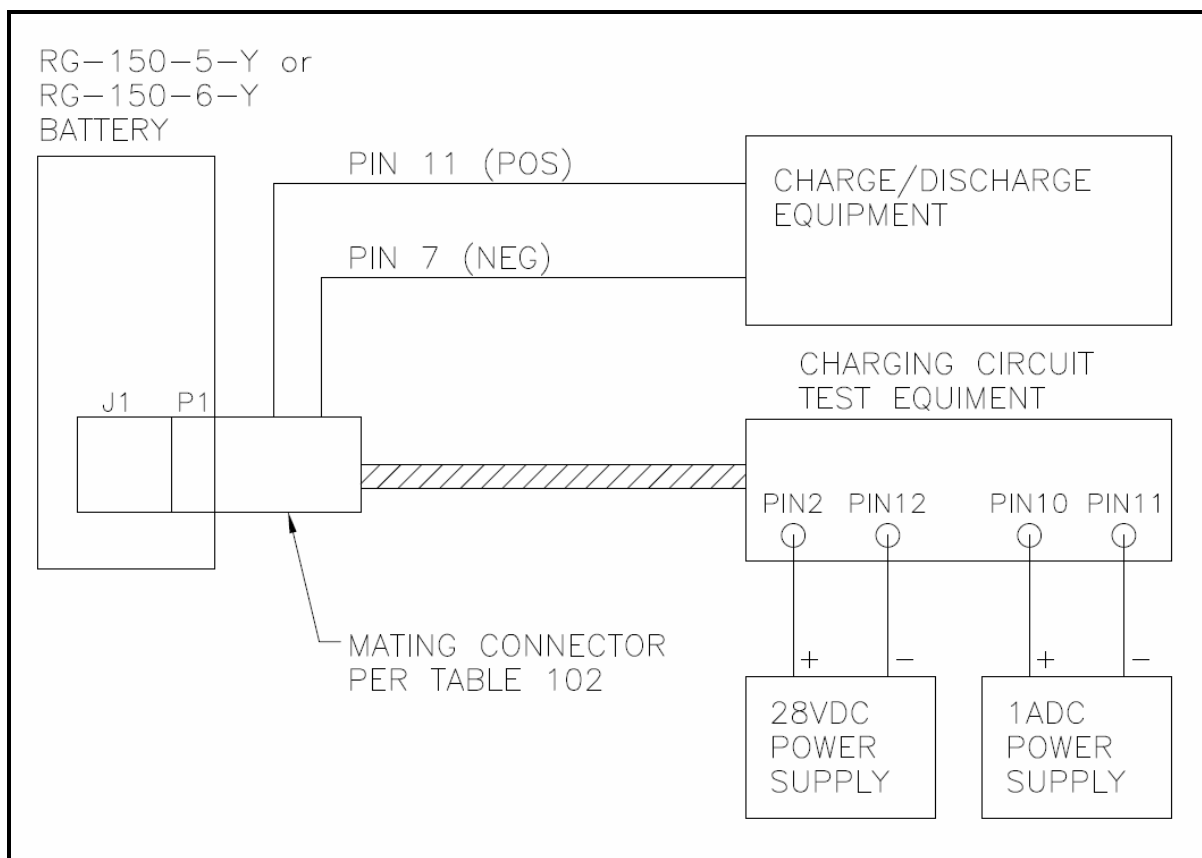


Figure 102. Test Set Up for RG-150-5-Y and RG-150-6-Y Series Batteries

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6. Capacity Test Procedure

- A. Stabilize the battery at 20EC (68EF) or higher. The battery must be at this temperature for at least 16 hours.
- B. If the OCV is 20 volts or above, charge the battery at constant potential per Section 7. If the OCV is less than 20 volts, perform the deep discharge recovery charge per Section 9.
- C. Connect the battery to the discharge equipment and discharge at the rate given in Table 103.
- D. Discharge the battery to an EPV of 20 volts or other EPV specified by the airframe or equipment manufacturer.
- E. Record the minutes and Amp-hour capacity to the EPV. The Amp-hour capacity can be calculated using this formula: Minutes/60 x Discharge rate in amperes.
- F. The battery passes the test if the Amp-hour capacity is equal to or greater than the value shown in the 85% Capacity column of Table 103.
- G. The battery is over 90% if the Amp-hour capacity is above the value shown in the 90% Capacity column of Table 103.

NOTE: AIRFRAME OR ACCESSORY EQUIPMENT MANUFACTURERS MAY SPECIFY A DIFFERENT CAPACITY REQUIREMENT, WHICH SHOULD TAKE PRECEDENCE.

- H. If the battery passes the capacity test, charge at constant potential per Section 7 and return battery to full state of charge. The battery is acceptable for installation.
- I. If the battery fails the capacity test, perform the conditioning procedure given in Section 8. After the battery has been conditioned repeat the capacity test.
- J. If the battery passes the second capacity test, charge at constant potential per Section 7 and return battery to full state of charge. The battery is acceptable for installation.
- K. If the battery fails the second capacity test, repeat the conditioning charge and repeat the capacity test.
- L. If the battery passes the third capacity test, charge at constant potential per Section 7 and return battery to full state of charge. The battery is acceptable for installation.
- M. If the battery fails the third capacity test, the monobloc assembly should be replaced.
- N. If the battery gets very hot (external case temperature greater than 55EC/130EF) during charging, the monobloc assembly should be replaced.

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7. Constant Potential Charge Procedure

NOTE: CONSTANT POTENTIAL CHARGING IS THE PREFERRED METHOD OF CHARGING THE BATTERY. IF THE BATTERY DOES NOT PASS THE CAPACITY TEST, THE CONDITIONING CHARGE PROCEDURE SHOULD THEN BE USED.

- A. Connect the battery terminals to the constant potential charging equipment.
- B. Apply a constant potential of 28.2 ± 0.2 volts with a current capability of at least 3.5 amperes.
- C. Charge until the charge current falls below 5% of the battery C1 rating (i.e., 0.175 ampere for a 3.5AH battery) and then continue charging at the same constant potential for a minimum of 4 more hours.

NOTE: TERMINATE CHARGING IF THE CHARGE CURRENT DOES NOT FALL BELOW 5% OF THE BATTERY C1 RATING WITHIN 8 HOURS.

8. Conditioning Charge Procedure

WARNING: THIS PROCEDURE SHOULD ONLY BE DONE IN A WELL VENTILATED AREA BECAUSE A SIGNIFICANT AMOUNT OF HYDROGEN GAS MAY BE RELEASED FROM THE BATTERY.

CAUTION (1): A CONDITIONING CHARGE IS ONLY NECESSARY IF THE BATTERY FAILS THE CAPACITY TEST. THIS PROCEDURE MAY SHORTEN THE BATTERY'S LIFE IF PERFORMED ON A REPETITIVE BASIS.

CAUTION (2): THIS PROCEDURE WILL CAUSE THE BATTERY VOLTAGE TO GO AS HIGH AS 34 VOLTS WHICH COULD DAMAGE ELECTRONIC CIRCUITS CONNECTED TO A BATTERY BUS. DO NOT PERFORM A CONDITIONING CHARGE WHILE THE BATTERY IS INSTALLED IN AN AIRCRAFT.

CAUTION (3): IF THE BATTERY BECOMES HOT (ABOVE 55EC/130EF) DURING THIS CHARGE, STOP THE CURRENT AND ALLOW THE BATTERY TO COOL TO ROOM TEMPERATURE BEFORE CONTINUING THE CHARGE.

- A. Discharge the battery at the rate given in Table 103 to an EPV of 20 volts (if the battery has already been discharged to this EPV, skip this step).
- B. Connect the battery to the constant current charging equipment per Table 101.
- C. Charge at a constant current rate of C1 /10 (i.e., 0.35 Amps for a 3.5 Ah battery) for 16 hours, then discontinue charging. The conditioning charge does not need to be continuous, i.e., pauses may be included. For example, an 8 hour charge on the first day followed by an 8 hour charge on the second day is allowable.
- D. After charging, allow the battery to cool down for at least 8 hours or until the battery temperature is within 10EC/18EF of the ambient temperature, then proceed with the capacity test.

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9. Deep Discharge Recovery Procedure

WARNING: THIS PROCEDURE SHOULD ONLY BE DONE IN A WELL VENTILATED AREA BECAUSE A SIGNIFICANT AMOUNT OF HYDROGEN GAS MAY BE RELEASED FROM THE BATTERY.

CAUTION (1): THIS PROCEDURE WILL CAUSE THE BATTERY VOLTAGE TO GO AS HIGH AS 34 VOLTS (17 VOLTS FOR 12V BATTERIES) WHICH COULD DAMAGE ELECTRONIC CIRCUITS CONNECTED TO A BATTERY BUS. DO NOT PERFORM A DEEP DISCHARGE RECOVERY CHARGE WHILE THE BATTERY IS INSTALLED IN AN AIRCRAFT.

CAUTION (2): IF THE BATTERY BECOMES HOT (ABOVE 55EC/130EF) DURING THE CHARGE, STOP THE CURRENT AND ALLOW THE BATTERY TO COOL TO ROOM TEMPERATURE BEFORE CONTINUING THE CHARGE.

NOTE: CHARGING EQUIPMENT USED FOR THIS PROCEDURE MUST BE CAPABLE OF OUTPUTTING AT LEAST 34 VOLTS (17 VOLTS FOR 12 VOLT BATTERIES) TO MAINTAIN A CONSTANT CURRENT THROUGHOUT THE ENTIRE CHARGE PERIOD.

- A. Connect the battery to the constant current charging equipment per Table 101.
- B. Charge at a constant current rate of C1/10 (i.e., 0.35 ampere for a battery with a C1 rating of 3.5AH) until the battery voltage reaches 31.0 volts, then continue charging at the same constant current rate for an additional 4 hours. The charge cycle should be continuous when using this method, i.e., no pauses should be included. However, if there is an interruption (e.g., due to a local power outage), continue from where the profile stopped and run to completion.

NOTE (1): IF THE BATTERY VOLTAGE EXCEEDS 31 VOLTS AT THE BEGINNING OF CHARGE AND THEN DROPS BELOW 31 VOLTS WITHIN 2 HOURS, CONTINUE CHARGING AT CONSTANT CURRENT UNTIL THE VOLTAGE REACHES 31 VOLTS A SECOND TIME. THEN CONTINUE CHARGING FOR AN ADDITIONAL 4 HOURS AS SPECIFIED ABOVE.

NOTE (2): IF THE BATTERY VOLTAGE DOES NOT REACH 31 VOLTS WITHIN 24 HOURS, THE CHARGE SHOULD BE TERMINATED.

- C. After the charge is complete, allow the battery to cool down for at least 8 hours or until the battery temperature is within 10EC/18EF of the ambient temperature, then proceed with the capacity test.

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10. Charging Circuit Test

- A. Refer to Figure 101 for testing the charging circuit of RG-150-1-Y and RG-150-2-Y batteries and Figure 102 for testing the charging circuit of RG-150-5-Y and RG-150-6-Y batteries.
- B. Test Procedure for RG-150-1-Y and RG-150-2-Y:
 1. Verify that the circuit breaker is closed (button pushed in).
 2. Using a constant current power supply, apply 1.0 ± 0.1 ADC across Pin 5 (+) and Pin 8 (-). Using a DMM, measure the voltage drop between Pin 5 (DMM+) and Pin 8 (DMM-). Charging circuit fails if voltage drop is more than 1.0 volt.
 3. Using a constant current voltage power supply, apply 28.0 ± 0.5 VDC across Pin 2 (+) and Pin 6 (-). Using a DMM, measure the resistance between Pin 5 (DMM+) and Pin 8 (DMM-). Charging circuit fails if resistance is less than 1.0 megohm.
- C. Test Procedure for RG-150-5-Y and RG-150-6-Y:
 1. Verify that the circuit breaker is closed (button pushed in).
 2. Using a constant current power supply, apply 1.0 ± 0.1 ADC across Pin 10 (+) and Pin 11(-). Using a DMM, measure the voltage drop between Pin 10 (DMM+) and Pin 11 (DMM-). Charging circuit fails if voltage drop is more than 1.0 volt.
 3. Using a constant current voltage power supply, apply 28.0 ± 0.5 VDC across Pin 2 (+) and Pin 12 (-). Using a DMM, measure the resistance between Pin 10 (DMM+) and Pin 11 (DMM-). Charging circuit fails if resistance is less than 1.0 megohm.
- D. If the charging circuit fails, the back shell assembly should be replaced. Otherwise, the battery is considered acceptable for installation.

11. Fault Isolation Summary

Symptom	Probable Cause	Corrective Action
Low voltage / no voltage.	Battery partially or fully discharged.	Perform capacity test.
	Battery circuit breaker tripped.	Reset circuit breaker.
Battery capacity less than 85% of rating.	Battery cells beyond serviceable life.	Replace monobloc assembly.
Battery does not hold charge.	Battery cells beyond serviceable life.	Replace monobloc assembly.
Battery gets hot while recharging.	Battery cells beyond serviceable life.	Replace monobloc assembly.
Battery fails charging circuit test.	Charging circuit failure.	Replace back shell assembly.

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SCHEMATIC AND WIRING DIAGRAMS

1. General

- A. The schematic diagram for the RG-150-1-Y battery is shown in Figure 201.
- B. The schematic diagram for the RG-150-2-Y battery is shown in Figure 202.
- C. The schematic diagram for the RG-150-5-Y battery is shown in Figure 203.
- D. The schematic diagram for the RG-150-6-Y battery is shown in Figure 204.

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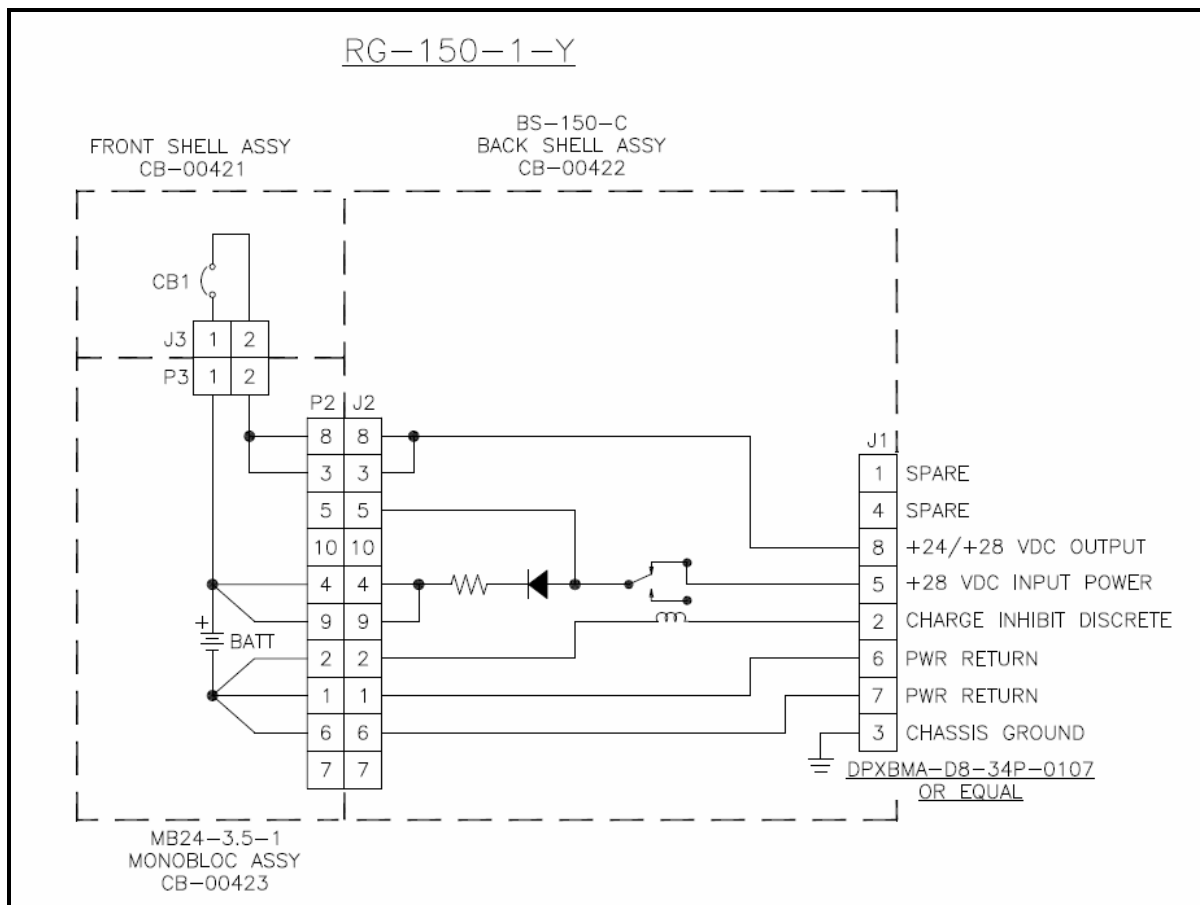


Figure 201. Schematic Diagram for RG-150-1-Y Battery

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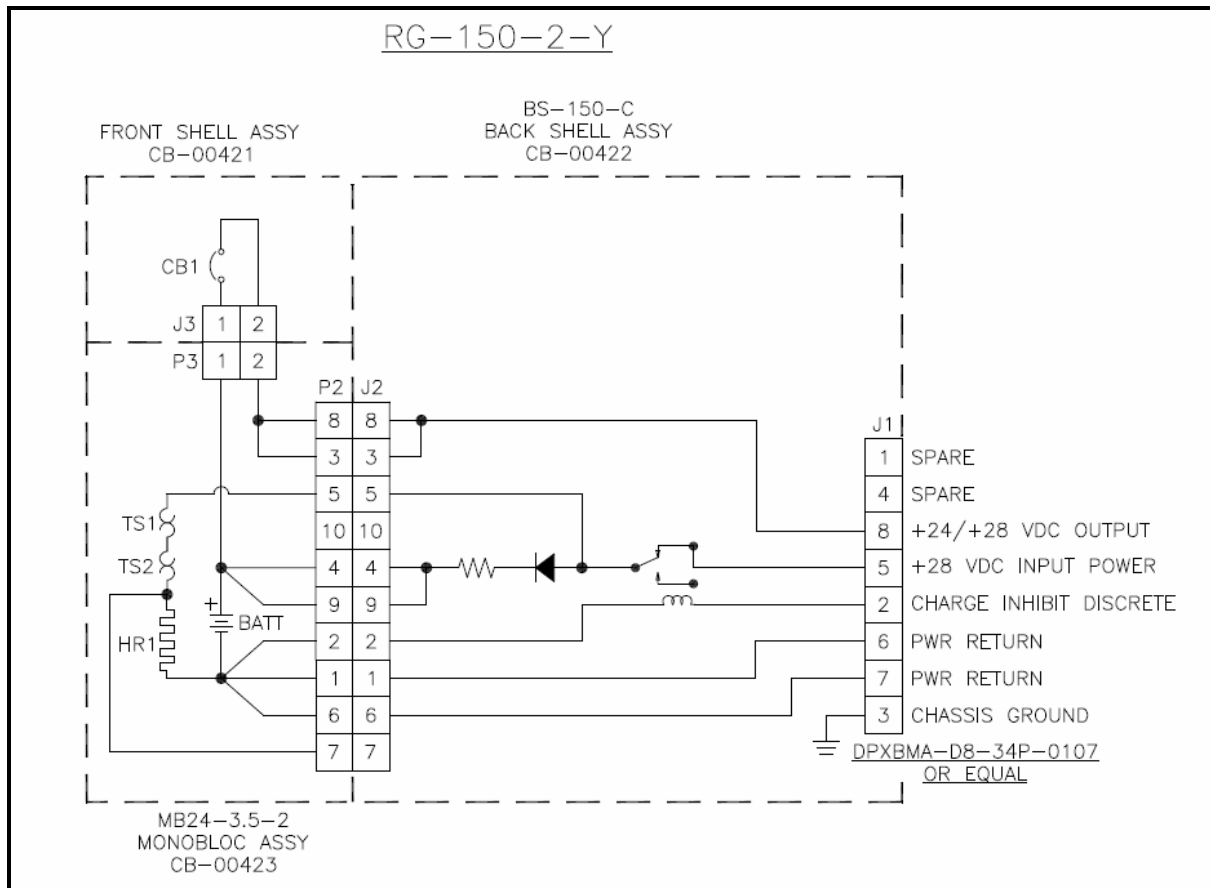


Figure 202. Schematic Diagram for RG-150-2-Y Battery

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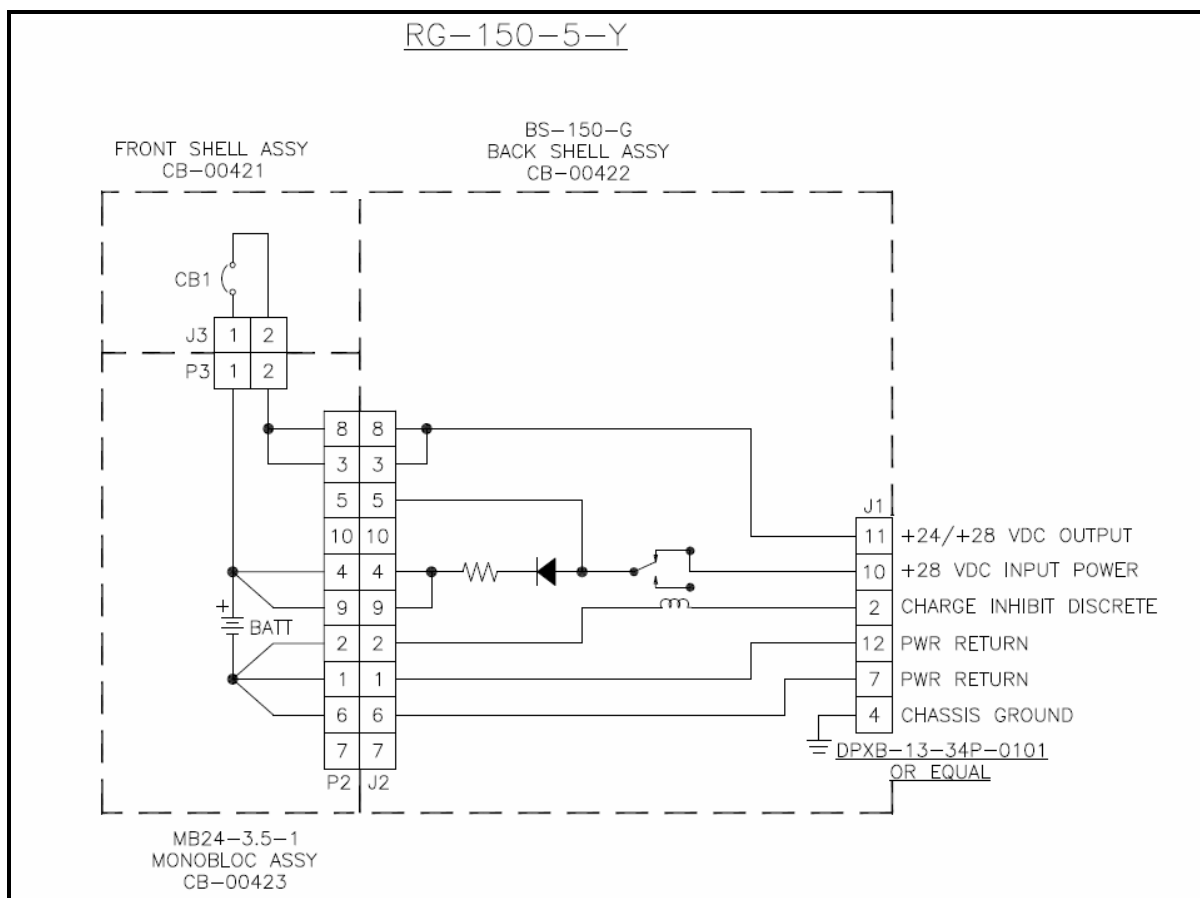


Figure 203. Schematic Diagram for RG-150-5-Y Battery

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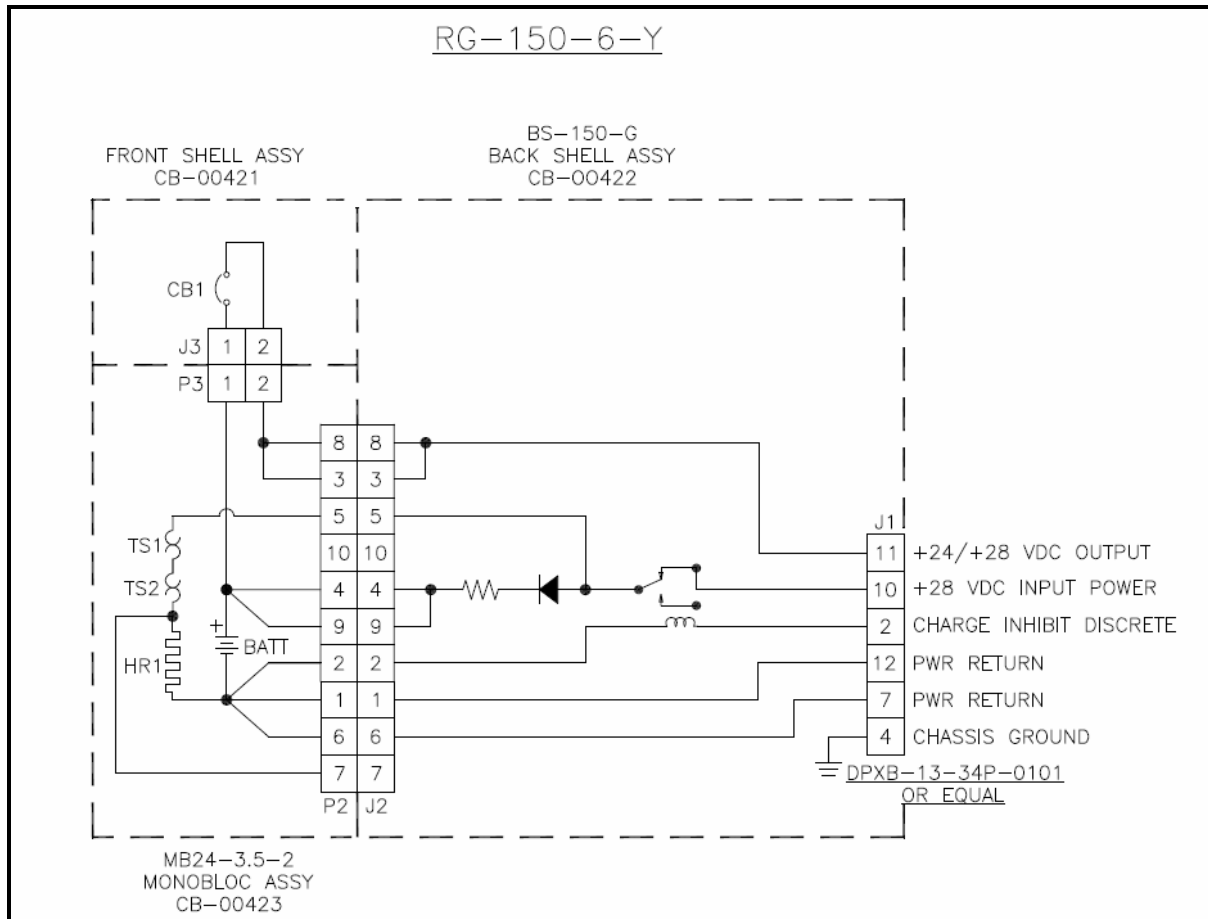


Figure 204. Schematic Diagram for RG-150-6-Y Battery

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DISASSEMBLY

1. General

- A. Each RG-150 Series battery has a front shell assembly, a monobloc assembly and a back shell assembly. The monobloc assembly and back shell assembly are field-replaceable; the front shell assembly is not field-replaceable.
- B. Table 301 identifies the part number of each assembly for the various battery models.
- C. Refer to Figure 1 and Table 1001 of the Illustrated Parts (IPL) for disassembly details of RG-150-1-Y and RG-150-2-Y batteries.
- D. Refer to Figure 2 and Table 1002 of the Illustrated Parts List (IPL) for disassembly details of RG-150-5-Y and RG-150-6-Y batteries.

Table 301. Part Number Identification of Battery Assemblies

Battery P/N	Front Shell Assy P/N (Not Field-Replaceable)	Back Shell Assy P/N (Field Replaceable)	Monobloc Assy P/N (Field Replaceable)
RG-150-1-Y	CB-00421-1-Y	BS-150-C	MB24-3.5-1
RG-150-2-Y	CB-00421-2-Y	BS-150-C	MB24-3.5-2
RG-150-5-Y	CB-00421-5-Y	BS-150-G	MB24-3.5-1
RG-150-6-Y	CB-00421-6-Y	BS-150-G	MB24-3.5-1

2. Tools, Fixtures, Equipment and Consumables

- A. Tools: Phillips screwdriver (commercially available).

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR THIS ITEM.

3. Back Shell Assembly Removal

- A. Remove the six (6) 6-32 Phillips screws attaching the back shell to the front shell (Item No 25 in IPL).

NOTE: REFER TO IPL TO IDENTIFY THE CORRECT SCREWS.

- B. Separate the back shell from the front shell just far enough to access the 10-pin electrical connector.
- C. Unplug the 10-pin electrical connector to separate the wiring harness from the back shell assembly.
- D. Isolate the back shell and replace as required.

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4. Monobloc Assembly Removal

- A. Remove the back shell assembly per Section 3.
- B. Remove the twelve (12) 4-40 Phillips screws attaching the monobloc assembly to the front shell (Item No. 20 in IPL).

NOTE: REFER TO IPL TO IDENTIFY THE CORRECT SCREWS.

- C. Slide monobloc assembly to the rear of the front shell until it stops.
- D. Separate the monobloc assembly from the front shell just far enough to access the 2-pin electrical connector.
- E. Unplug the 2-pin electrical connector to separate the wiring of the monobloc assembly from the front shell.
- F. Isolate the monobloc assembly and replace as required.

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CLEANING

1. General

- A. This section contains general cleaning instructions for Concorde aircraft batteries.
- B. Batteries do not need to be disassembled for cleaning.

CAUTION: DO NOT USE ANY TYPE OF SOLVENT TO CLEAN THE BATTERY. SOLVENTS MAY DAMAGE THE BATTERY.

2. Tools, Fixtures, Equipment and Consumables

- A. Consumables: Lint-free shop cloth (commercially available) and tap water (commercially available).

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR THESE ITEMS.

3. External Cleaning

- A. Clean the outside surfaces of the battery with a clean, dry, oil-free cloth.
- B. If the battery has caked-on dirt or grime, use a cloth dampened with tap water, then wipe dry.

4. Internal Cleaning:

- A. Internal cleaning is not required.

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CHECK

1. General
 - A. This section contains general checking instructions for Concorde aircraft batteries.
 - B. Batteries do not need to be disassembled for checking.
2. Tools, Fixtures, Equipment and Consumables
 - A. None required.
3. External Checking
 - A. Check the outside surfaces of the battery for dents, cracks or corrosion that may affect the battery's operation.
 - B. Check the battery for loose or missing fasteners.
 - C. Check the identification and informational labels to ensure they are legible and securely attached.
 - D. If the above checks reveal items that need attention, repair or replace battery as appropriate.
4. Internal Checking
 - A. Internal checks are not required.

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REPAIR AND DISPOSAL

1. General

A. Batteries covered by this CMM are repairable to the extent described below.

2. RG-150 Series Repair Provisions

A. RG-150-1-Y and RG-150-2-Y batteries have two field-replaceable assemblies:

Monobloc Assembly: P/N MB24-3.5-1 (contains battery cells, no heater) or P/N MB24-3.5-2 (contains battery cells, with heater).

Back Shell Assembly: P/N BS-150-C (contains internal 10-pin electrical connector and external 8-pin receptacle).

B. RG-150-5-Y and RG-150-6-Y batteries have two field-replaceable assemblies:

Monobloc Assembly: P/N MB24-3.5-1 (contains battery cells, no heater) or P/N MB24-3.5-2 (contains battery cells, with heater).

Back Shell Assembly: P/N BS-150-G (contains internal 10-pin electrical connector and external 13-pin receptacle).

C. These field-replaceable assemblies are not repairable and must be replaced if they go bad.

D. Refer to the Section on TESTING AND FAULT ISOLATION to determine if the monobloc assembly or back shell assembly need to be replaced.

E. Instructions for replacement of circuit breaker (CB) on Front Shell assembly:

1. Remove the Back Shell Assembly and Monobloc Assembly from the Front Shell Assembly as described on page 301 of this CMM.
2. Remove the 7/16" nut and lock washer that secure the circuit breaker to the front plate of the Front Shell assembly.
3. Remove the CB from the hole in the front plate and clamp the CB body in a vice.
4. Remove the two Phillips head screws from the CB terminals.

NOTE: The threads of the screws have thread locking compound (Loctite #272) which may make it difficult to remove the screws. To avoid stripping the screw head, it may be necessary to heat the head of the screw with a soldering iron before removing the screws.

5. Discard the failed/broken CB and obtain a new CB conforming to MS3320-X (Concorde P/N 8845-X or equivalent), where X is the rating of the CB. Refer to Table 1001 or 1002 for available part numbers.
6. Apply thread locking compound (Loctite #272 or equivalent) to the threads of the two Phillips head screws furnished with the new CB.
7. Fasten the ring terminals of the wires from J3-1 and J3-2 to the CB terminals using the screws and lock washers furnished with the new CB.

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8. Apply thread locking compound (Loctite #272 or equivalent) to the threads of the CB mounting screw and insert it into the hole in the front plate of the Front Shell Assembly.
 9. Thread and tighten the nut and lock washer furnished with the new CB onto the CB mounting screw to fasten the CB to the Front Shell Assembly.
 10. Assemble the Monobloc Assembly and Back Shell Assembly to the Front Shell Assembly per pages 701-702.
 11. Perform a capacity test on the battery assembly per page 106 to confirm airworthiness.
3. Disposal
- A. Concorde aircraft batteries contain lead, sulfuric acid, and other hazardous materials. Never discard batteries in the trash or in a landfill.
 - B. Dispose spent batteries and assemblies in accordance with local ordinances and regulations.
 - C. These aircraft batteries are encased in aluminum containers, which need to be removed before the battery cells are sent to the lead smelter for recycling. Make sure the recycling collector is aware of this requirement.
 - D. See battery Material Safety Data Sheet (MSDS) for additional information.

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ASSEMBLY

1. General

- A. Each RG-150 Series battery has a front shell assembly, a monobloc assembly and a back shell assembly. The monobloc assembly and back shell assembly are field-replaceable; the front shell assembly is not field-replaceable.
- B. Table 701 identifies the part number of each assembly for the various battery models.
- C. Refer to Figure 1 and Table 1001 of the Illustrated Parts (IPL) for disassembly details of RG-150-1-Y and RG-150-2-Y batteries.
- D. Refer to Figure 2 and Table 1002 of the Illustrated Parts List (IPL) for disassembly details of RG-150-5-Y and RG-150-6-Y batteries.

Table 701. Part Number Identification of Battery Assemblies

Battery P/N	Front Shell Assy P/N (Not Field-Replaceable)	Back Shell Assy P/N (Field Replaceable)	Monobloc Assy P/N (Field Replaceable)
RG-150-1-Y	CB-00421-1-Y	BS-150-C	MB24-3.5-1
RG-150-2-Y	CB-00421-2-Y	BS-150-C	MB24-3.5-2
RG-150-5-Y	CB-00421-5-Y	BS-150-G	MB24-3.5-1
RG-150-6-Y	CB-00421-6-Y	BS-150-G	MB24-3.5-1

2. Tools, Fixtures, Equipment and Consumables

- A. Tools: Phillips screwdriver (commercially available).
- B. Consumables: Removable thread locker, Loctite No. 425, Hernon No. 128, or equivalent (commercially available).

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR THESE ITEMS.

3. Monobloc Assembly Installation

- A. Inspect the monobloc assembly for damage. Do not use monobloc assembly if it appears to be damaged, contact Concorde for assistance.
- B. Mate the 2-pin connector to join the wiring harnesses of the monobloc assembly to the front shell assembly.

NOTE: THE CONNECTORS ARE KEYED SO THEY WILL ONLY MATE IN THE PROPER ORIENTATION.

- C. Join the monobloc assembly to the front shell by aligning the cell rays with the notches in the front shell.
- D. Slide the monobloc assembly forward, taking care not to pinch any of the wires.
- E. Apply thread locker (Loctite No. 425, Hernon No. 128, or equivalent) to the threads of the twelve (12) 4-40 Phillips head screws.

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- F. Insert and tighten the twelve (12) 4-40 Phillips screws. Torque to 10 inch-lbs (1.1 Nm).
- G. Update servicing records with the P/N and S/N of the new monobloc assembly, as applicable.

NOTE: REFER TO PAGE 1501 FOR BATTERY STORAGE AND INSTALLATION INSTRUCTIONS AFTER REPLACING THE MONOBLOC ASSEMBLY.

4. Back Shell Assembly Installation

- A. Inspect the back shell assembly for damage. Do not use back shell assembly if it appears to be damaged, contact Concorde for assistance.
- B. Mate in the 10-pin connector of the monobloc assembly to the 10-pin connector in the back shell assembly.

NOTE: THE CONNECTOR IS KEYED SO THAT IT WILL ONLY MATE IN THE PROPER ORIENTATION.

- C. Join the back shell to the front shell taking care not to pinch any of the wires.
- D. Apply thread locker (Loctite No. 425, Hernon No. 128, or equivalent) to the threads of the six (6) 6-32 Phillips head screws.
- E. Insert and tighten all six (6) screws. Torque to 10 inch-lbs (1.1 Nm).
- F. Update servicing records with the P/N and S/N of the new back shell assembly, as applicable.

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FITS AND CLEARANCES

1. General
 - A. Refer to the envelope drawing for the RG-150-1-Y, RG-150-2-Y, RG-150-5-Y or RG-150-6-Y battery, as applicable. The envelope drawing provides overall dimensions, mounting provisions, and maximum weight of the battery.
 - B. The latest approved envelope drawings are available on Concorde's website (see front page of this CMM).
 - C. If internet access is not available, contact Concorde for assistance (see front page of this CMM).

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SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES

1. Tools

A. Phillips Head screwdriver (commercially available).

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR THIS ITEM.

2. Fixtures

A. Not applicable.

3. Equipment

A. Refer to Tables 901 and 902.

Table 901. List of Equipment

Description	Source	Part Number	Purpose
Electronic Load, capable of 1.0 to 3.5ADC constant current with termination at 20 VDC EPV.	Commercially Available	N/A	Capacity Testing
Constant Voltage Power Supply, capable of 28.2 " 0.2 VDC and at least 3.5 ADC output.	Commercially Available	N/A	Constant Potential Charging and Testing Charging Circuit
Constant Current Power Supply, capable of 0.35 to 1.0 " 0.05 ADC and at least 34 VDC output.	Commercially Available	N/A	Constant Current Charging and Testing Charging Circuit
Digital Multimeter (DMM), capable of 0.1 ohms to 1 Megohm with accuracy of 1% or better.	Commercially Available	N/A	Testing Charging Circuit and Measuring OCV
Mating Connector	Commercially Available	See Table 902	Connect Battery to Test Equipment
No. 12 and No. 16 Gauge Socket Probes	Commercially Available	N/A	Connect Battery to Test Equipment (as an alternative to using mating connector)

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR THESE ITEMS.

CAUTION: CONTACT CONCORDE FOR ASSISTANCE WITH SELECTION OF BATTERY CHARGING EQUIPMENT. SOME BRANDS OF BATTERY CHARGERS WILL DAMAGE THE BATTERY.

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Table 902. List of Mating Connectors

Battery Type	Battery Receptacle	Mating Connector*
RG-150-1-Y and RG-150-2-Y	DPXBMA-D8-34P-0107	DPXBMA-D8-33S-0007
RG-150-5-Y and RG-150-6-Y	DPXB-13-34P-0101	DPXB-13-33S-0001

***NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR THIS ITEM.**

4. Consumables

- A. Lint-free cloth (commercially available).
- B. Locktite No. 425 or Hernon No. 128 thread locker (commercially available).
- C. Tap water (commercially available).

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR THESE ITEMS.

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STORAGE (INCLUDING TRANSPORTATION)

1. Storage Conditions

- A. Batteries are serviced and charged at the factory prior to shipment.
- B. To minimize self-discharge, batteries should be stored in a cool location, ideally below 20EC (68EF).
- C. The open circuit voltage (OCV) of a fully charged battery is approximately 26.0 volts. As the battery state of charge drops due to self-discharge, its OCV also declines.
- D. Batteries should be boost charged per Section 6 when the OCV declines to 25.0 volts.
- E. Batteries with an OCV below 25.0 volts must be capacity tested per Section 7 before being placed in service.
- F. Batteries in storage for longer than 24 months must be capacity tested per Section 7 before being placed in service.

CAUTION: WHEN BATTERIES ARE INSTALLED IN AIRCRAFT DURING STORAGE (OR EXTENDED PERIODS OF NON-USE), IT IS BEST TO DISCONNECT THE BATTERY CONNECTOR. THIS PRACTICE WILL ELIMINATE UNNECESSARY DRAIN ON THE BATTERY WHEN PARASITIC LOADS ARE PRESENT. OTHERWISE, THE BATTERY SERVICE LIFE MAY BE ADVERSELY AFFECTED.

2. Storage Facilities

- A. Concorde valve regulated lead-acid aircraft batteries may be stored and serviced in any battery facility, including nickel-cadmium service facilities. These batteries are sealed to prevent cross contamination of the electrolyte.
- B. Lead-acid batteries can produce explosive mixtures of hydrogen and oxygen while being charged or discharged. Never service batteries in an airtight or sealed enclosure and make sure the work area is well ventilated.

3. Tools, Fixtures, Equipment and Consumables

- A. Refer to Tables 901 and 902.

4. Test Set Up

- A. Refer to Figure 101 for testing RG-150-1-Y and RG-150-2-Y batteries.
- B. Refer to Figure 102 for testing RG-150-5-Y and RG-150-6-Y batteries.

5. Preparation for Installation

- A. Remove battery from the shipping carton and visually inspect the battery for signs of damage. Do not use the battery if it appears to be damaged, contact Concorde for assistance.
- B. Measure the battery's open circuit voltage (OCV) with a DMM.
- C. If the OCV equals or exceeds 25.5 volts, the battery can be installed in the aircraft without charging.

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- D. If the OCV is between 25.0 and 25.5 volts, apply a boost charge per Section 6. The battery can then be installed in the aircraft.
- E. If the OCV is below 25.0 volts, perform a capacity test per Section 7 before installing in the aircraft.
- F. If the battery has been in storage for longer than 24 months, perform a capacity test per Section 7 before installing in the aircraft.

6. Boost Charge Procedure

NOTE: CONSTANT POTENTIAL CHARGING IS THE PREFERRED METHOD OF BOOST CHARGING THE BATTERY. IF THE BATTERY FAILS THE CAPACITY TEST, THE CONDITIONING CHARGE PROCEDURE SHOULD BE USED.

- A. Connect the battery terminals to the constant voltage charging equipment.
- B. Apply a constant potential of 28.2 ± 0.2 volts with a current limit of at least 3.5 ADC.
- C. Charge until charge current falls below 5% of the battery C1 rating (i.e., 0.175 ampere for 3.5AH battery) and then continue charging at the same constant potential for a minimum of 4 more hours.

NOTE: TERMINATE CHARGING IF THE CHARGE CURRENT DOES NOT FALL BELOW 5% OF THE BATTERY C1 RATING WITHIN 8 HOURS.

7. Capacity Test Procedure

- A. Stabilize the battery at 20EC (68EF) or higher. The battery must be at this temperature for at least 16 hours.
- B. If the OCV is 20 volts or above, charge the battery at constant potential charge per Section 6. If the OCV is below 20 volts, perform the deep discharge recovery charge per Section 9.
- C. Connect the battery to the discharge equipment and discharge at the rate given in Table 103.
- D. Discharge the battery to an EPV of 20 volts or other EPV specified by the airframe or equipment manufacturer.
- E. Record the minutes and Amp-hour capacity to the EPV. The Amp-hour capacity can be calculated using this formula: Minutes/60 x Discharge rate in amperes.
- F. The battery passes the test if the Amp-hour capacity is equal to or greater than the value shown in the 85% Capacity column of Table 103.
- G. The battery is over 90% if the Amp-hour capacity is above the value shown in the 90% Capacity column of Table 103.

NOTE: AIRFRAME OR ACCESSORY EQUIPMENT MANUFACTURERS MAY SPECIFY A DIFFERENT CAPACITY REQUIREMENT, WHICH SHOULD TAKE PRECEDENCE.

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- H. If the battery passes the capacity test, charge at constant potential per Section 6 and return battery to full state of charge. The battery is acceptable for installation.
- I. If the battery fails the capacity test, perform the conditioning procedure given in Section 8. After the battery has been conditioned repeat the capacity test.
- J. If the battery passes the second capacity test, charge at constant potential per Section 6 and return battery to full state of charge. The battery is acceptable for installation.
- K. If the battery fails the second capacity test, repeat the conditioning charge and repeat the capacity test.
- L. If the battery passes the third capacity test, charge at constant potential per Section 6 and return battery to full state of charge. The battery is acceptable for installation.
- M. If the battery fails the third capacity test, the monobloc assembly should be replaced.
- N. If the battery gets very hot (external case temperature greater than 55EC/130EF) during charging, the monobloc assembly should be replaced.

8. Conditioning Charge Procedure

WARNING: THIS PROCEDURE SHOULD ONLY BE DONE IN A WELL VENTILATED AREA BECAUSE A SIGNIFICANT AMOUNT OF HYDROGEN GAS MAY BE RELEASED FROM THE BATTERY.

CAUTION (1): A CONDITIONING CHARGE IS ONLY NECESSARY IF THE BATTERY FAILS THE CAPACITY TEST. THIS PROCEDURE MAY SHORTEN THE BATTERY'S LIFE IF PERFORMED ON A REPETITIVE BASIS.

CAUTION (2): THIS PROCEDURE WILL CAUSE THE BATTERY VOLTAGE TO GO AS HIGH AS 34 VOLTS WHICH COULD DAMAGE ELECTRONIC CIRCUITS CONNECTED TO A BATTERY BUS. DO NOT PERFORM A CONDITIONING CHARGE WHILE THE BATTERY IS INSTALLED IN AN AIRCRAFT.

CAUTION (3): IF THE BATTERY BECOMES HOT (ABOVE 55EC/130EF) DURING THIS CHARGE, STOP THE CURRENT AND ALLOW THE BATTERY TO COOL TO ROOM TEMPERATURE BEFORE CONTINUING THE CHARGE.

- A. Discharge the battery at the rate given in Table 103 to an EPV of 20 volts (if the battery is already discharged to this EPV, skip this step).
- B. Connect the battery to the constant current charging equipment per Table 901.
- C. Charge at a constant current rate of C1 /10 (i.e., 0.35 Amps for a 3.5 Ah battery) for 16 hours, then discontinue charging. The conditioning charge does not need to be continuous, i.e., pauses may be included. For example,

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- D. an 8 hour charge on the first day followed by an 8 hour charge on the second day is acceptable.
- E. After charging, allow the battery to cool down for at least 8 hours or until the battery temperature is within 10EC/18EF of the ambient temperature, then proceed with the capacity test.

9. Deep Discharge Recovery Procedure

WARNING: THIS PROCEDURE SHOULD ONLY BE DONE IN A WELL VENTILATED AREA BECAUSE A SIGNIFICANT AMOUNT OF HYDROGEN GAS MAY BE RELEASED FROM THE BATTERY.

CAUTION (1): THIS PROCEDURE WILL CAUSE THE BATTERY VOLTAGE TO GO AS HIGH AS 34 VOLTS (17 VOLTS FOR 12V BATTERIES) WHICH COULD DAMAGE ELECTRONIC CIRCUITS CONNECTED TO A BATTERY BUS. DO NOT PERFORM A CONDITIONING CHARGE WHILE THE BATTERY IS INSTALLED IN AN AIRCRAFT.

CAUTION (2): IF BATTERY BECOMES HOT (ABOVE 55EC/130EF) DURING THE CONDITIONING CHARGE, STOP THE CURRENT AND ALLOW BATTERY TO COOL TO ROOM TEMPERATURE BEFORE CONTINUING THE CHARGE.

NOTE: CHARGING EQUIPMENT USED FOR THIS PROCEDURE MUST BE CAPABLE OF OUTPUTTING AT LEAST 34 VOLTS (17 VOLTS FOR 12 VOLT BATTERIES) TO MAINTAIN A CONSTANT CURRENT THROUGHOUT THE ENTIRE CHARGE PERIOD.

- A. Connect the battery to the constant current charging equipment per Table 901.
- B. Charge at a constant current rate of C1/10 (i.e., 0.35 ampere for a battery with a C1 rating of 3.5AH) until the battery voltage reaches 31.0 volts (15.5 volts for 12 Volt batteries), then continue charging at the same constant current rate for an additional 4 hours. The charge cycle should be continuous when using this method, i.e., no pauses should be included. However, if there is an interruption (e.g., due to a local power outage), continue from where the profile stopped and run to completion.

NOTE (1): IF THE BATTERY VOLTAGE EXCEEDS 31 VOLTS AT THE BEGINNING OF CHARGE AND THEN DROPS BELOW 31 VOLTS WITHIN 2 HOURS, CONTINUE CHARGING AT CONSTANT CURRENT UNTIL THE VOLTAGE REACHES 31 VOLTS A SECOND TIME. THEN CONTINUE CHARGING FOR AN ADDITIONAL 4 HOURS AS SPECIFIED ABOVE.

NOTE (2): IF THE BATTERY VOLTAGE DOES NOT REACH 31 VOLTS WITHIN 24 HOURS, THE CHARGE SHOULD BE TERMINATED.

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- C. After the charge is complete, allow the battery to cool down for at least 8 hours or until the battery temperature is within 10EC/18EF of the ambient temperature, then proceed with the capacity test.

10. Transportation

- A. If the OCV is less than 25.5 volts, charge the battery per Section 6 before shipment.
- B. The battery should be packaged in its original container. If the original container is not available, follow local packaging regulations applicable to the mode of transport.
- C. RG-150 Series batteries are classified as a “NONSPILLABLE BATTERY” and comply with hazardous shipping exceptions of the International Air Transport Association (IATA) Dangerous Goods Regulations, International Maritime Dangerous Goods (IMDG) Code, and US Department of Transportation (DOT). As such, they can be shipped as non-hazardous by any means when packaged in original container and terminals are protected from short circuit. Refer to battery MSDS for additional information, including shipping paper requirements.

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ILLUSTRATED PARTS LIST

1. General

A. This section provides an Illustrated Parts List (IPL) for identification of replacement parts. IPL Figures 1 and 2 show the battery assembly in a disassembled state with reference numbers that designate replaceable items. Tables 1001 and 1002 provide detailed information for the items shown in Figures 1 and 2, respectively (along with any replaceable items not shown in the figures).

2. Description of Columns

A. Figure & Item Number: Each item in Table 1001 and 1002 is assigned a unique item number. The item number is used to find the part on the IPL figure. A dash (-) before the item number identifies parts not shown on the figure.

B. Part Number: The part number column gives the Concorde part number in ATA format. This format may be different than the true Concorde part number because the ATA format only permits dashes between numeric characters. For example, RG-150-1 is not a permitted part number, and is shown as RG150-1 in the part number column. The true part number (e.g., RG-150-1) is given in the Nomenclature column.

C. Airline Part Number: Reserved for airline use.

D. Nomenclature: The nomenclature column uses the indenture system to show relationships of the higher and lower assemblies. A repairable assembly has its detail parts given in the next indenture below and indented to the right. The next higher assembly of any detail part is given above and indented to the left. Attaching parts immediately follow the part or assembly that they attach, and have the same indenture.

E. EFF Code: The Effectivity (EFF) Code column is used when more than one assembly configuration is contained in the IPL. Effectivity codes identify the next higher assembly on which an item is used. For example, code AC shows that an item is used on assemblies A and C but not on other assemblies. Any part without an Effectivity code is used on all configurations.

F. Unit per Assy: This column shows the quantity of a part used for each figure and item number. The letters RF (reference) are given for part numbers used only for identification in the table (for example, the top assemblies). The letters AR (as required) identify a part whose quantity is variable and becomes defined during the assembly procedure.

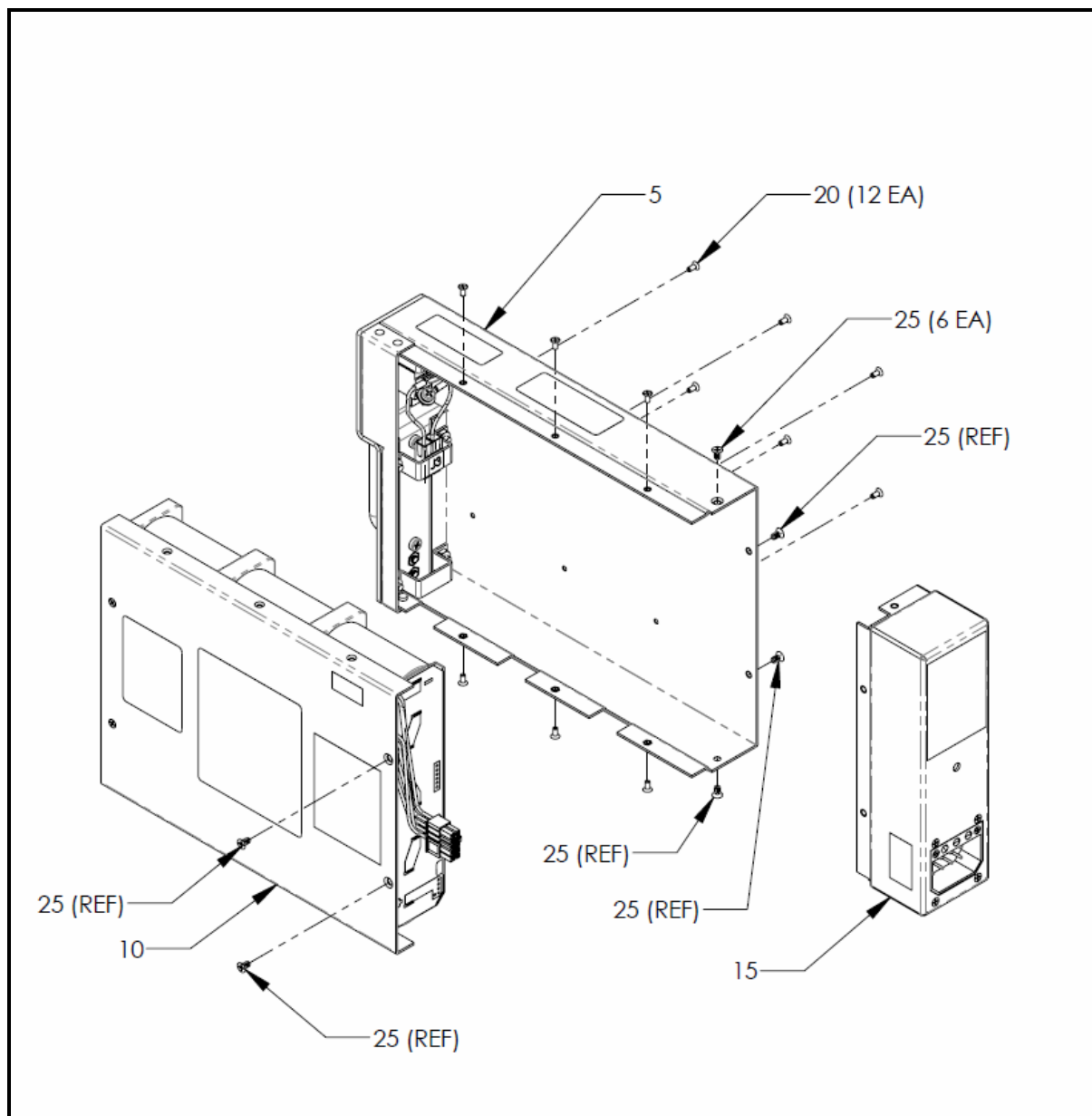
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3. Vendor Information

A. The vendor of all parts shown in the parts list is as follows:

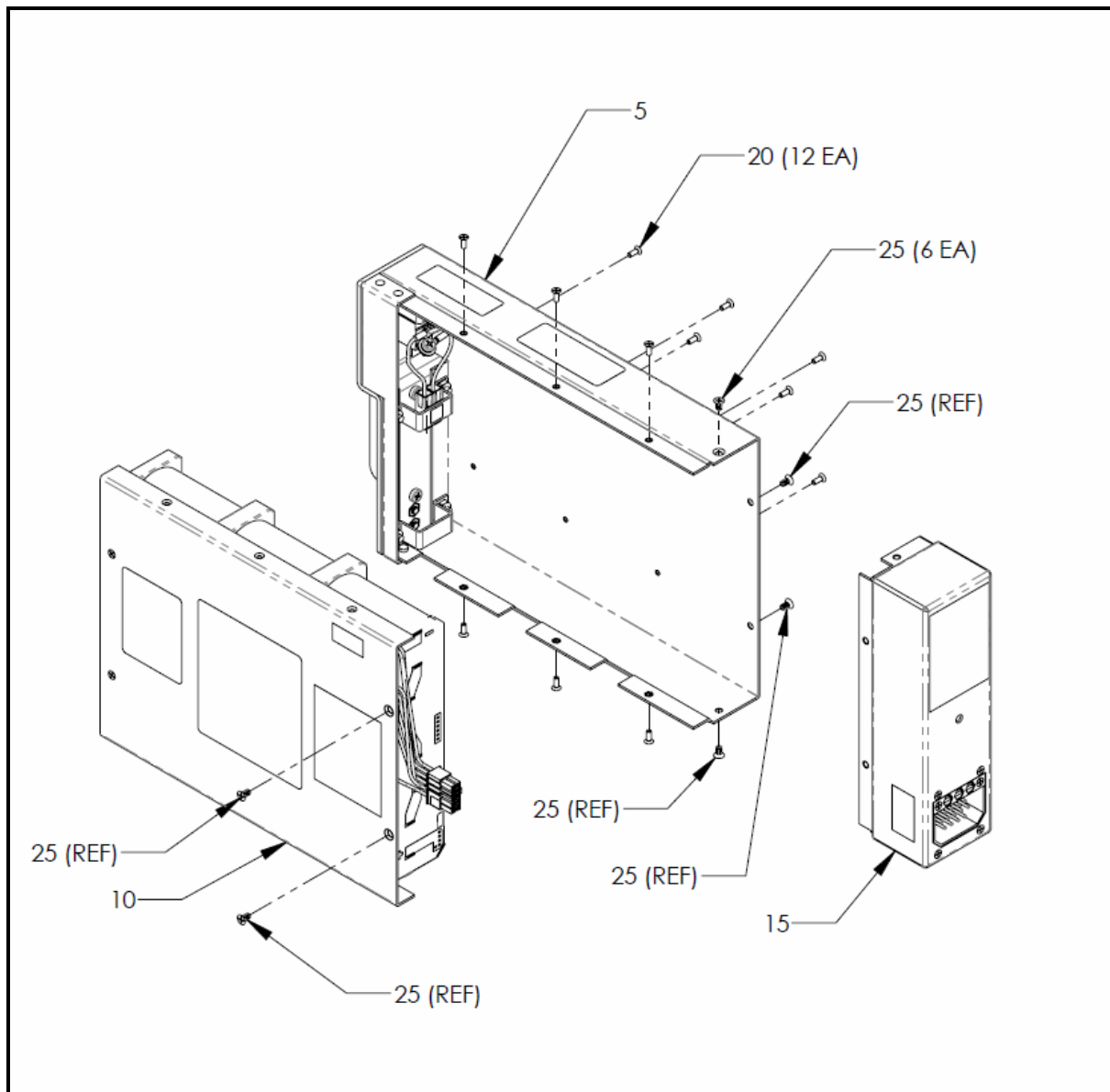
Vendor Code	Name and Address
63017	Concorde Battery Corporation 2009 San Bernardino Road West Covina, CA 91780 USA

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IPL Figure 1. Exploded View of RG-150-1-Y and RG-150-2-Y Batteries

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IPL Figure 2. Exploded View of RG-150-5-Y and RG-150-6-Y Batteries

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Table 1001. Detailed Parts List for RG-150-1-Y and RG-150-2-Y Batteries

FIGURE & ITEM NO.	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
Fig.1					
-1	RG150-1-Y		BATTERY ASSEMBLY, RG-150-1-Y (TRUE P/N: RG-150-1-Y)	A	RF
-1A	RG150-2-Y		BATTERY ASSEMBLY, RG-150-2-Y (TRUE P/N: RG-150-2-Y)	B	RF
5	CB00421-1-Y		. RG-150-1 Front Shell Assembly (TRUE P/N: CB-00421-1-Y)	A	1
-6	8845-X X = CB Rating		. CIRCUIT BREAKER, MS3320-X, X = 1, 2, 2.5, 3, 4, 5, 7.5, 10, 15, 20 or 25 (CB rating in Amps)	A	1
-5A	CB00421-2-Y		. RG-150-2 Front Shell Assembly (TRUE P/N: CB-00421-2-Y)	B	1
-6	8845-X X = CB Rating		. CIRCUIT BREAKER, MS3320-X, X = 1, 2, 2.5, 3, 4, 5, 7.5, 10, 15, 20 or 25 (CB rating in Amps)	B	1
10	MB24-3.5-1		. MB24-3.5-1 Monobloc Assembly	A	1
-10A	MB24-3.5-2		. MB24-3.5-2 Monobloc Assembly	B	1
15	BS150C		. BS-150-C Back Shell Assembly (TRUE P/N: BS-150-C)	A,B	1
			-----ATTACHING PARTS-----		
20	6431		. SCREW, 100E FLAT HEAD, 6-32X1/4, SST		6
25	6432-3		. SCREW, 100E FLAT HEAD, 4-40X5/16, SST		12
-30	8813		. LOCTITE, DARK BLUE NO. 425 (NOT SHOWN)		AR
-30A	7608		. THREADLOCKER, HERNON NO. 128 (NOT SHOWN, ALTERNATIVE TO LOCTITE NO. 425)		AR

NOTE: DASH (-) ITEM NOT ILLUSTRATED.

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Table 1002. Detailed Parts List for RG-150-5-Y and RG-150-6-Y Batteries

FIGURE & ITEM NO.	PART NUMBER	AIRLINE PART NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
Fig.2					
-1	RG150-5-Y		BATTERY ASSEMBLY, RG-150-5-Y (TRUE P/N: RG-150-5-Y)	A	RF
-1A	RG150-6-Y		BATTERY ASSEMBLY, RG-150-6-Y (TRUE P/N: RG-150-6-Y)	B	RF
5	CB00421-5-Y		. RG-150-5 Front Shell Assembly (TRUE P/N: CB-00421-5-Y)	A	1
-6	8845-X X = CB Rating		. CIRCUIT BREAKER, MS3320-X, X = 1, 2, 2.5, 3, 4, 5, 7.5, 10, or 15 Amps (CB rating in Amps)	A	1
-5A	CB00421-6-Y		. RG-150-6 Front Shell Assembly (TRUE P/N: CB-00421-6-Y)	B	1
-6	8845-X X = CB Rating		. CIRCUIT BREAKER, MS3320-X, X = 1, 2, 2.5, 3, 4, 5, 7.5, 10 or 15 (CB rating in Amps)	B	1
10	MB24-3.5-1		. MB24-3.5-1 Monobloc Assembly	A	1
-10A	MB24-3.5-2		. MB24-3.5-2 Monobloc Assembly	B	1
15	BS150G		. BS-150-G Back Shell Assembly (TRUE P/N: BS-150-G)	A,B	1
			-----ATTACHING PARTS-----		
20	6431		. SCREW, 100E FLAT HEAD, 6-32X1/4, SST		6
25	6432-3		. SCREW, 100E FLAT HEAD, 4-40X5/16, SST		12
-30	8813		. LOCTITE, DARK BLUE NO. 425 (NOT SHOWN)		AR
-30A	7608		. THREADLOCKER, HERNON NO. 128 (NOT SHOWN, ALTERNATIVE TO LOCTITE NO. 425)		AR

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