Transmittal Sheet

This Transmittal Sheet informs the users/holders of the Component Maintenance Manual (CMM) ATA reference 33-51-01 for the Battery PNR 3301-31 of the new revision No. 10 dated Oct 10/2023.

Please remove the pages changed by this revision.

PAGE BLOCK	DESCRIPTION OF CHANGE
Front Matter	Title Page updated to include new revision No. 10 Record of Revisions updated Record of Temporary Revisions deleted List of Effective Pages updated Table of Contents updated
Introduction	List of Abbreviations revised
Testing And Fault Isolation	Paragraph 5.C.(1): Optional Fast Charge Procedure revised
Disassembly	Table 3001: Automatic DC Current Sink added Task "DISCHARGE OF BATTERY" revised
Repair	Table 6001: IPC-J-STD-004 added Table 6002 revised
Special Tools, Fixtures, Equipment...	Table 9001 revised
Special Procedures	Page block added with trickle charge procedure
Illustrated Parts List	Numerical Index updated IPL Fig. 1, Items 50A and 50B: Text "NOT PROCURABLE" added

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ABBREVIATED COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

Battery

3301-31

This CMM is applicable only to the Battery made by DIEHL Aerospace GmbH. Please examine type plate for correct vendor code D1347 and for correct part number 3301-31 without prefix and/or suffix.

Users are kindly requested to tell DIEHL Aerospace GmbH of inconsistencies, omissions or errors found in this document.

Make sure, that you have the latest revision of this document. If you are working with extracts from this document, make sure that these extracts have the same revision status as the document.

RECORD OF REVISIONS

RE. NO.	ISSUE DATE	INSERTED	
		DATE	BY
00	Jul 08/2002		
01	Sep 17/2004		
02	Jun 06/2006		
03	Jul 25/2011		
04	Jun 11/2012		
05	Aug 18/2014		
06	Oct 21/2014		
07	Mar 20/2015		
08	Sep 26/2017		
09	Mar 08/2018		
10	Oct 10/2023		

RE. NO.	ISSUE DATE	INSERTED	
		DATE	BY

Retain this record in the front of the manual.

On receipt of revisions, insert revised page in the manual and enter revision number, date and initials.

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SERVICE BULLETIN LIST

SERVICE BULLETIN NO./TITLE	MOD. NO.	REV. NO.	ISSUE DATE	STATUS
3301-33-01 Visual Inspection and Modification of Battery Pack	04	00	Dec 05/2014	Incorporated
3301-33-02 Introduction of Improved Battery Block	05	00	Nov 23/2017	Incorporated

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LIST OF EFFECTIVE PAGES

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INTRODUCTION

TASK 33-51-01-99F-801-A00

1. GENERAL

A. Specifications and Contents

(1) This Component Maintenance Manual agrees to the ATA Specification 2200 (known as iSpec 2200). It is written in ASD-STE100 Simplified Technical English (formerly known as AECMA Simplified English).

(2) SI units of measurement are used in this manual, with Imperial units in parentheses.

(3) This manual gives data and shop-verified instructions to do maintenance, tests and repairs on the Battery in a workshop. It does not give instructions to do maintenance on the component when it is installed in the aircraft.

(4) Maintenance Task Oriented Support System (MTOSS) task and subtask identification is used in this manual. The maintenance tasks and other data have special MTOSS numbers for the use of Electronic Data Processing (EDP). The MTOSS numbers can be ignored by the user of the manual.

(5) This manual contains:

- Technical data of the Battery,
- Functional description,
- Testing and fault isolation procedures,
- Maintenance and repair procedures for the Battery,
- An Illustrated Parts List (IPL) with data for the Battery parts. Parts are identified in all page blocks of the manual by the IPL figure and item number.

(6) Date of Shop Verification by Actual Performance:

- Testing and Fault Isolation: Verified MAY 23/2006
- Disassembly: Verified MAY 23/2006
- Assembly: Verified MAY 23/2006

B. How to Use the Manual

(1) Make sure that the manual contains the information applicable to your Battery. Look at the Title Page for the part number.

(2) If it is necessary to identify a part or to find a part number, refer to the IPL, which has an introduction to show the procedure.

(3) The instructions in this manual must be used for all the Battery maintenance. Read the applicable WARNINGS and CAUTIONS before you do the work on the Battery.

(4) DIEHL Aerospace GmbH is not responsible for maintenance on the Battery that is not done in accordance to instructions given in this manual.

C. Revision Service

(1) This manual will be revised when necessary to include current data.

(2) Service Bulletins are issued separately. If there is an effect of a Service Bulletin on this manual, the Service Bulletin will be recorded in the Service Bulletin List. The Service Bulletin List will be revised if necessary.

D. Management of Unwanted Materials

(1) The items given in this manual are composed of different electronic and mechanical materials. They can be finished with lacquer and can contain other chemical material like glue etc. The related consumable materials are named in this manual as required.

(2) The individual customer has to obey the individual national laws and regulations when parts/items/consumables have to be discarded.

E. Manufacturing

The Battery is made by:

DIEHL Aerospace GmbH
Cabin Customisation Interior
Donaustr. 120
D-90451 Nuernberg, GERMANY
FSCM: D1347

F. Technical Support

For technical support please refer to the web page of DIEHL Aerospace GmbH:

http://www.diehl-aerospace.com

NOTE: Tell the Customer Support Center first by E-mail or FAX, before you ship a Battery for support.

G. Units of Measurement

(1) Measurements given in this manual are taken from original equipment manufacturing drawings.

(2) Table 1 gives the conversion values from SI System to Imperial System.

FROM SI SYSTEM	TO IMPERIAL SYSTEM
1 hPa (= 1 mbar)	0.0145 psi
1 g	0.0022 lb (= 0.0353 oz)
1 kg (= 1000 g)	2.2046 lb
1 mm	0.0394 in.
1 m (= 1000 mm)	3.2808 ft
1 Nm	0.7376 lbf ft
1 daNm (= 10 Nm)	7.3756 lbf ft (= 88.5075 lbf in.)
°C	°F = (°C x 1.8) + 32

CONVERSION FROM SI TO IMPERIAL SYSTEM
TABLE 1

(3) Table 2 gives the conversion values from Imperial System to SI System.

FROM IMPERIAL SYSTEM	TO SI SYSTEM
1 psi	68.9476 hPa (mbar)
1 oz	28.3495 g
1 lb	0.4536 kg
1 in.	25.4 mm
1 ft	0.3048 m
1 lbf ft	1.3558 Nm
1 lbf in.	0.1130 Nm (= 0.01130 daNm)
°F	°C = (°F - 32) / 1.8

CONVERSION FROM IMPERIAL TO SI SYSTEM
TABLE 2

H. Warnings, Cautions and Notes

(1) WARNING:
Gives data on the use of materials, procedures or limits which must be obeyed accurately to prevent injury or death of persons.

(2) CAUTION:
Gives data on the use of materials, procedures or limits which must be obeyed accurately to prevent damage to aircraft or equipment.

(3) NOTE:
Gives data on procedures which make the work easier or give supplementary or explanatory data.

TASK 33-51-01-94A-801-A00

2. LIST OF ABBREVIATIONS

A	Ampere
A/C	Aircraft
AC	Alternating Current
ACMM	Abbreviated Component Maintenance Manual
AECMA	European Association of Aerospace Industries
Ah	Ampere Hour
AMDT	Amendment
Approx.	Approximately
AR	As Required
ASD	Aerospace and Defence Industries Association of Europe

ASSY	Assembly
ASY	Assembly
ATA	Air Transport Association of America
AWG	American Wire Gauge
C	Celsius
CAGE	Commercial And Government Entity
CLE	Cleaning
CMM	Component Maintenance Manual
CSK	Countersunk
D	Deleted
daNm	Deca Newton Meter
DAs	DIEHL Aerospace GmbH
DC	Direct Current
DET	Detail
DIS	Disassembly
DMM	Digital Multimeter
DPL	Detailed Parts List
EDP	Electronic Data Processing
EMI	Electro-Magnetic Interference
F	Fahrenheit
FIG	Figure
FSCM	Federal Supply Code for Manufacturers
ft	Foot (feet)
g	Gram
GND	(Common Signal) Ground
h	Hour
hPa	Hecto-Pascal
Hz	Hertz
in.	Inch

IPC	Association Connecting Electronics Industries
IPL	Illustrated Parts List
k	Kilo
lb.	Pound
lbf ft	Pound Force Feet
LED	Light Emitting Diode
M	Mega
MTOSS	Maintenance Task Oriented Support System
n	Nano
NC	Not Connected
NHA	Next Higher Assembly
NI	Numerical Index
NiCd	Nickel / Cadmium
Nm	Newton Meter
No	Number
NP	Not Procured
NTC	Negative Temperature Coefficient
OPT	Optional
oz	Ounce
p	Pico
PCB	Printed Circuit Board
PN	Part Number
PNR	Part Number
PREF	Preferred
psi	Pounds Per Square Inch
QTY	Quantity
R	Ohm
REF	Refer to
REP	Repair

REPLD	Replaced
REPLS	Replaces
REQ	Required
REV	Revision
RMS	Root Mean Square
RTN	Return
RTS	Return To Service
S	Second
SB	Service Bulletin
sec	Second
SI	System International
SPR	Special Procedures
STO	Storage Including Transportation
SUPSD	Superseded
SUPSDS	Supersedes
TC	Temperature Coefficient
TFI	Testing and Fault Isolation
TTL	Total
u	Micro
V	Volt
V_{CC}	Common Collector Voltage (Main Power Supply)
W	Watt

DESCRIPTION AND OPERATION

TASK 33-51-01-99F-802-A00

1. GENERAL

A. This page block gives the description and operation data for the Battery PNR 3301-31.

B. The initial issue (Revision 00) of this manual started as an ACMM (Abbreviated Component Maintenance Manual) for the non-repairable Battery amendments "AMDT –" and "AMDT A". The introduction of the repairable Battery "AMDT B" (starting with serial number 051501) changed the document type of this manual from ACMM to CMM (Component Maintenance Manual).

C. The Battery PNR 3301-31 given in this CMM replaces the Battery PNR 3301-30 given in CMM 33-51-07 in a two-way interchangeability.

TASK 33-51-01-870-801-A00

2. DESCRIPTION

A. Function of the Battery

(1) The Battery PNR 3301-31 is a rechargeable Battery based on Nickel-Cadmium technology.

(2) The Battery is part of the emergency lighting system of the aircraft. In case of a breakdown of the aircraft power supply, the Battery supplies electrical circuits with its stored energy for a specified time period.

B. Design of the Battery

(1) FIG. 1 gives a general view of the non-repairable Battery ("AMDT –" and "AMDT A"). FIG. 2 gives a general view of the repairable Battery ("AMDT B" and later).

(2) All parts of the Battery are installed in a closed plastic housing (1). For the repair of the Battery ("AMDT B" and later only) you can disassemble the housing with lateral snap-in pins.

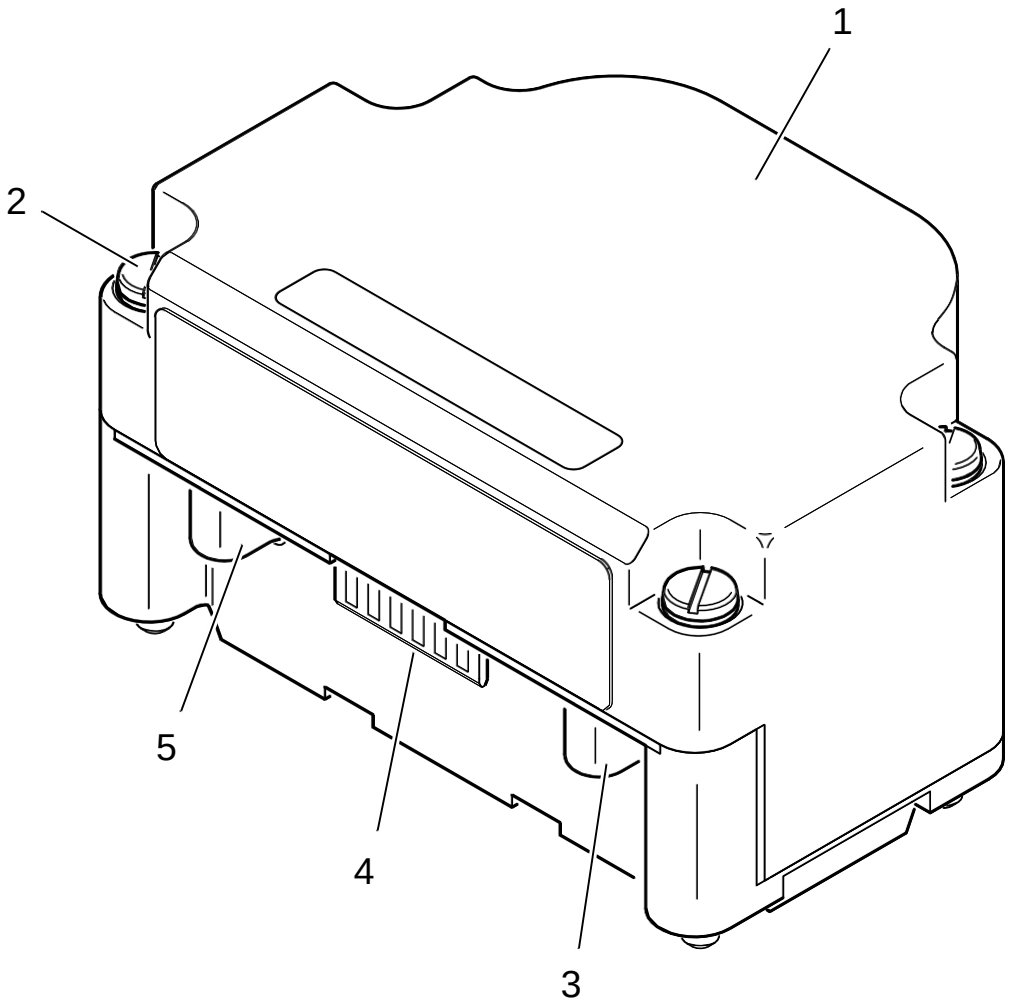
(3) The Battery Block Assembly has 5 Nickel-Cadmium cells connected in series (6).

(4) There is an elastic rubber clamping (8) between the cells and the housing top. The rubber clamping makes sure that the inner components of the Battery do not move and prevents vibrations.

(5) To optimize the reliability of the Battery for a wide range of temperature there is a Heating Foil (7), a sensor for temperature regulating and a thermostat in the housing. These components are connected to the Connector Module (4).

(6) The positive (+) Battery contact (3) and the negative (–) Battery contact (5) are high current female contacts.

(7) The Battery is attached to the connected emergency power supply unit with four captive screws (2).



1 Housing
2 Captive Screw
3 Battery Contact (+)
4 Connector Module
5 Battery Contact (-)

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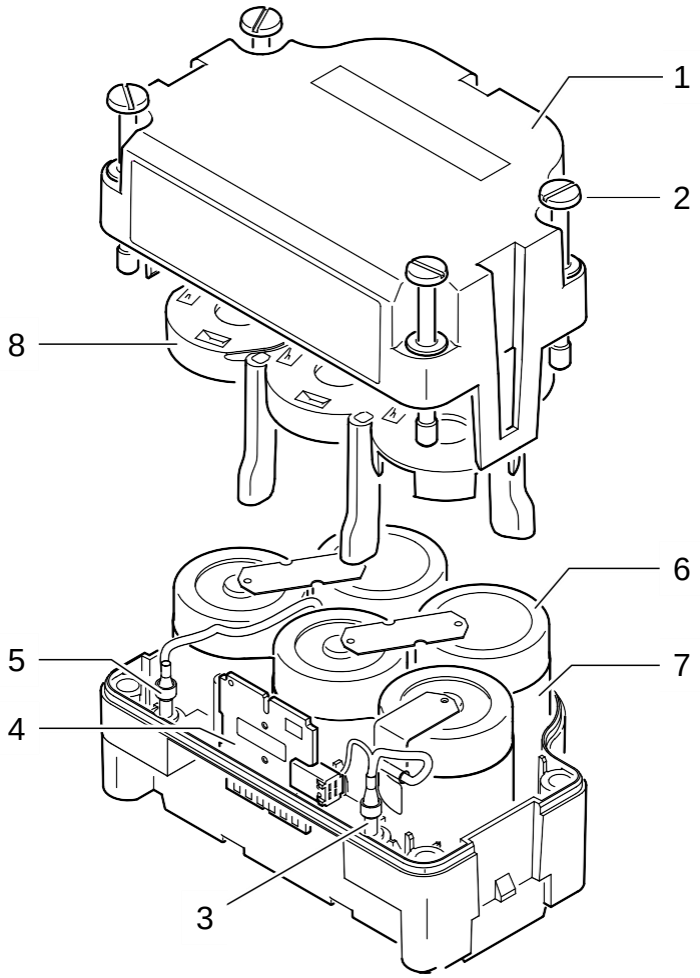
BATTERY, NON-REPAIRABLE ("AMDT –" AND "AMDT A")
FIGURE 1



1 Housing
2 Captive Screw
3 Battery Contact (+)
4 Connector Module
5 Battery Contact (-)
6 Battery Block
7 Heating Foil
8 Rubber Clamping

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BATTERY, REPAIRABLE ("AMDT B" AND LATER)
FIGURE 2

TASK 33-51-01-870-802-A00

3. OPERATION

NOTE: Refer to FIG. 3 for the equipment designators used in the description that follows.

A. The performance of the Battery is optimum at an operation temperature of 20 to 40 °C [68 to 104 °F]. At higher temperatures the chemical deterioration can be rapid enough during discharge to cause a loss of capacity.

B. During discharging, the temperature has an important effect on the voltage characteristics of the Battery and its service. This is because of the reduction in chemical activity and the increase in Battery internal resistance at lower temperatures.

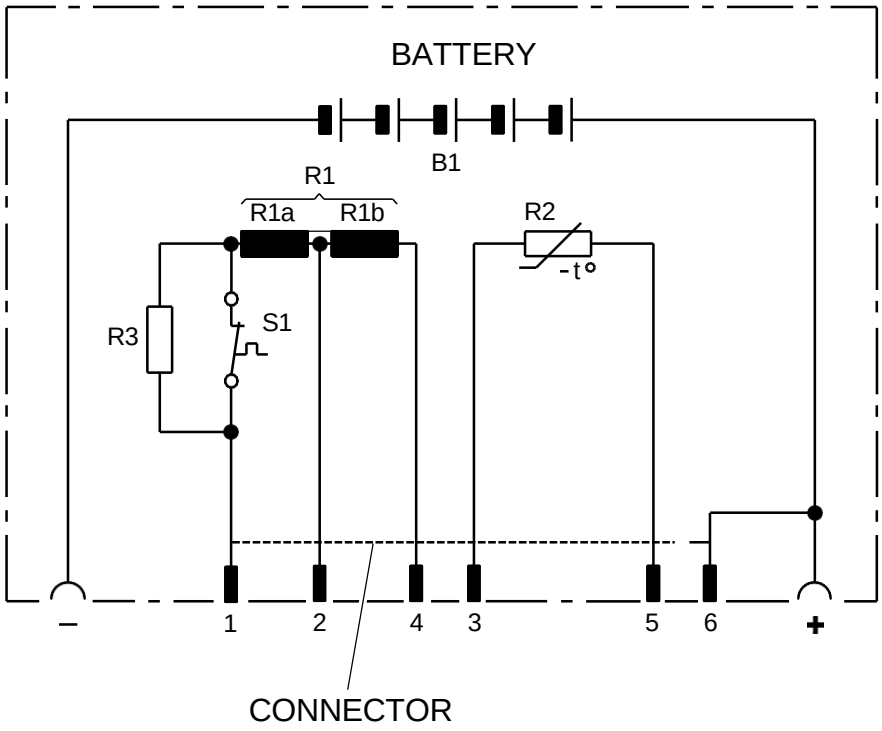
C. At low ambient temperatures the Heating Foil (R1) keeps the Battery temperature in the required range for best service.

D. Caused by technology, R1 splits up into two partial resistors:

- Battery "AMDT –" and "AMDT A":
  R1a = 0 Ω / R1b = 33.3 Ω to 40.7 Ω
- Battery "AMDT B" and later:
  R1a = 3 Ω to 4 Ω / R1b = 29.3 Ω to 37.7 Ω

E. The NTC resistor R2 is the sensor for the temperature regulating circuit which is a part of the connected emergency power supply unit. The thermostat S1 opens the heating current circuit at 45 ± 5 °C [113 ± 9 °F] in case of a malfunction of the regulating circuit.

F. The resistor R3 in parallel to thermostat S1 is necessary only to test the heating circuit.



BLOCK DIAGRAM
FIGURE 3

TASK 33-51-01-870-803-A00

4. TECHNICAL DATA

The tables that follow give the technical data for the Battery.

FEATURE	SPECIFICATION
Part Number	3301-31
Battery Type	Nickel-Cadmium (NiCd)
Nominal Voltage	6 V
Capacity:	
• AMDT –, AMDT A and AMDT B	4 Ah
• AMDT C and later	5 Ah
Number of Cells	5
Heating Foil	37 Ω / 20 W (nominal)
Temperature Sensor:	
• Type	NTC Resistor
• Resistance	12 kΩ (at normal room temperature)
Thermostat:	
• Function	Break Contact
• Set/Reset Temperature	
– Contact opens at:	45 ± 5 °C [113 ± 9 °F]
– Contact resets at:	less than or equal to 25 °C [77 °F]

ELECTRICAL DATA
TABLE 1

MODE	TEMPERATURE RANGE
Operation	-15 °C (5 °F) to +45 °C (113 °F)
Storage	Refer to page block STORAGE

TEMPERATURE RANGE
TABLE 2

FEATURE	SPECIFICATION
Length (max.)	116 mm (4.57 in.)
Width (max.)	81 mm (3.19 in.)
Height (max.)	65 mm (2.56 in.)
Weight (max.)	1.01 kg (2.22 lb.)

DIMENSIONS AND WEIGHT
TABLE 3

TASK 33-51-01-870-804-A00

5. GENERAL SAFETY PRECAUTIONS

CAUTION: OBEY THE SAFETY PROCEDURES AND PRECAUTIONS THAT FOLLOW AT ALL TIMES WHEN YOU HANDLE THE BATTERY OR THE BATTERY BLOCK.

- MAKE SURE THAT ALL PERSONS WHO HANDLE AND USE THE BATTERY FULLY KNOW THE PRECAUTIONS AND PROCEDURES GIVEN IN THIS MANUAL.
- USE ONLY THE SPECIFIED TEST EQUIPMENT TO CHARGE, DISCHARGE AND TEST THE BATTERY.
- STORE THE BATTERY IN A COOL, DRY AND SAFE ENVIRONMENT.
- DO NOT STORE THE BATTERY NEAR A SOURCE OF HEAT.
- DO NOT THROW THE BATTERY INTO FIRE, OR PLACE IT IN AN OVEN, STOVE, MICROWAVE OVEN OR IN A DIFFERENT HEATING APPLIANCE.
- DO NOT DROP OR THROW THE BATTERY, OR SUBJECT IT TO EXCESSIVE IMPACT OR SHOCK.
- STOP IMMEDIATELY USING OR CHARGING A BATTERY WHICH PRODUCES AN UNUSUAL ODOR, OVERHEATS OR CHANGES SHAPE OR COLOR.
- DO NOT SHORT-CIRCUIT THE POSITIVE (+) AND THE NEGATIVE (–) TERMINAL OF THE BATTERY. REMOVE ALL JEWELLERY FROM YOUR WRISTS AND FINGERS.
- THE BATTERY CONTAINS THE POLLUTANT CADMIUM. FOR DISPOSAL OBEY THE LOCAL AUTHORITY REGULATIONS. BEFORE DISPOSAL FULLY DISCHARGE THE BATTERY.

TASK 33-51-01-870-805-A00

6. MODIFICATION HISTORY

A. The current modification status (AMDT) of the Battery is given on or adjacent to the identification label.

B. Table 4 gives the modifications applicable to the Battery. The modifications are given by the modification letters in the CODE column of the table.

CODE	DESCRIPTION
–	New Battery PNR 3301-31 replaces Battery PNR 3301-30 in a two-way interchangeability. PNR 3301-31 is classified as non-repairable.
A	Change of inner Battery design (improvement of compensation pad).
B	Modification of Battery design to make the housing removable and the Battery repairable. Change of manual type from ACMM to CMM.
C	Welded Battery Block PNR 0001006935 replaced by PNR 0001015307. Housing bottom PNR 0001004330 replaced by PNR 0001017495.
D	Housing bottom PNR 0001017495 replaced by PNR 0001028681. Introduction of new Battery packaging PNR 0001028820.
E	Welded Battery Block PNR 0001015307 replaced by PNR 0001040957.

MODIFICATION LIST
TABLE 4

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TASK 33-51-01-99F-803-A00

1. GENERAL

A. Contents

WARNING: **READ THE MANUFACTURER'S INSTRUCTIONS BEFORE YOU OPERATE THE TEST EQUIPMENT. MAKE SURE THAT THE EQUIPMENT IS SET TO THE CORRECT VOLTAGE.**

(1) This page block gives the test procedures for the Battery.

(2) The procedures are functional tests only. For fault isolation refer to the fault isolation chart (Table 1002).

(3) All the results of the test procedures must be satisfactory before you put the Battery back to service or into storage.

(4) The tests have to be done to the Battery

- after maintenance work,
- to make sure that the Battery is in Return To Service (RTS) condition.

B. Test Conditions

(1) The necessary environmental conditions for the procedures are:

(a) Ambient Temperature:
18 °C (64 °F) to 30 °C (86 °F)

(b) Relative Humidity:
less than 80 %

(c) Atmospheric Pressure:
Local standard (typical 840 to 1070 hPa [12.2 to 15.5 psi])

(2) Obey these recommendations, if possible:

- Do not do the test procedures immediately after storage, if there is a large difference of temperature or humidity between the locations of storage and test.
- Let the Battery stay in the above conditions for approximately two hours before you do the test procedure.

TASK 33-51-01-940-801-A00

2. LIST OF TOOLS AND EQUIPMENT

The tools and equipment given in Table 1001 are used in this page block.

NOTE: You can use equivalent alternatives for items in the list.

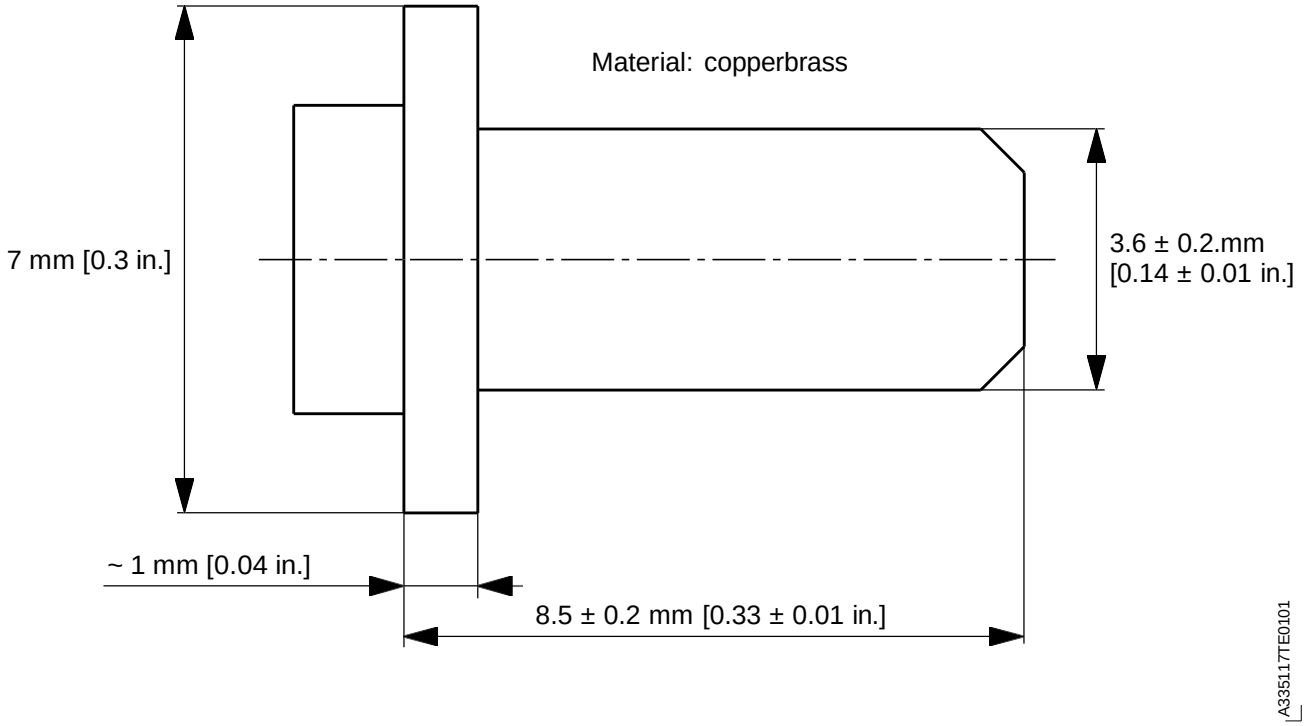
EQUIPMENT	SPECIFICATION OR PART NUMBER	SOURCE OR CAGE CODE
DC Power Supply	1 - 10 V, adjustable ± 0.5 V 0.05 - 0.5 A, adjustable ± 0.02 A	Locally available
Insulation Test Equipment	500 V_{DC} ± 10 V, 10 - 100 MΩ	Locally available
Digital Multimeter (DMM)	True RMS, e.g. FLUKE 87V	Locally available
Automatic DC Current Sink	6.0 A_{DC} const.	Locally available
Climatic Chamber	Temperature adjustable 10 to 60 °C [50 to 140 °F]	Locally available
Stop Watch	Elapsed time: 1 to 30 minutes	Locally available
Contact Pin	PNR 0000402673 (2 ea.); Ref. FIG. 1001	D1347
Option:		
Connector 39-pole, sockets	e.g. PNR 851-00R20-39S50 1)	F0225
Option:		
Battery Analyzer	Type C7400ER or C7400ER C-Series	D1347
Adapter	PNR 07-110-9200 (1-4 ea.)	D1347
Software	Battery 1 Shop Software, V 6.x. 7.x 3)	D1347
Or:		
Battery Charge Adapter	PNR EP4-025-67B 2)	D1347
Discharge Test Set	PNR EP4-025-57.1A 2)	D1347

1) For optional charge procedure with EPSU only

2) Not procurable (out of production)

3) Refer to Vendor Service Information Letter D1347-33-035 for latest software version

LIST OF TOOLS AND EQUIPMENT
TABLE 1001



CONTACT PIN
FIGURE 1001

TASK 33-51-01-700-802-A00

3. VISUAL CHECK

A. Examine the contacts of the Connector Module. Make sure that

- the contacts are clean,
- there are no signs of abrasion and corrosion.

B. Examine the two contacts of the positive (+) and the negative (–) Battery terminal. Make sure that

- the contacts are clean,
- there are no signs of corrosion, overheating or damage,
- the contacts are attached correctly.

C. Examine the Battery housing for scores, nicks, cracks, cuts and other obvious defects. Make sure that there are no signs of

- effects caused by handling,
- thermal damage.

D. Examine the Battery for completeness of parts.

E. Move the Battery in all three axes and shake lightly. Make sure that there are no loose parts in the Battery.

F. Examine the identification and modification labels. Make sure that

- the labels are correctly attached,
- you can read the labels,
- the labels identify the DIEHL Aerospace GmbH Battery and not an uncertified plagiarism of a copycat manufacturer (e.g. part number starting with prefix AD...).

G. For Battery "AMDT B" and later only: Make sure that the top and the bottom of the Battery housing are snapped in correctly.

TASK 33-51-01-700-804-A00

4. INSULATION TEST

WARNING: **DO NOT TOUCH THE BATTERY DURING THE TEST. HIGH VOLTAGES CAN KILL. MAKE SURE THAT THERE IS A SECOND PERSON AVAILABLE NEAR THE TEST AREA.**

CAUTION: THE INSULATION TEST CAUSES STRESS TO THE BATTERY. DO THIS TEST ONLY IF THE VERIFICATION OF THE INSULATION RESISTANCE IS MANDATORY, I.E. AFTER REPAIR WORK THAT HAS AN EFFECT ON THE INSULATION RESISTANCE.

A. Connect the negative terminal of the insulation test equipment to the negative (–) Battery contact and the positive terminal to contact no. 1 of the connector.

B. Set the test voltage to 500 V_{DC}. Make sure that the insulation resistance is more than or equal to 10 MΩ.

C. Set the test voltage to 0 V. Remove the insulation test equipment terminal from contact no. 1 and connect it to contact no. 3 of the connector.

D. Set the test voltage to 500 V_{DC}. Make sure that the insulation resistance is more than or equal to 10 MΩ.

E. Set the test voltage to 0 V. Remove the insulation test equipment terminal from the negative (–) Battery contact and connect it to contact no. 1 of the connector.

F. Set the test voltage to 500 V_{DC}. Make sure that the insulation resistance is more than or equal to 10 MΩ.

G. Set the test voltage to 0 V. Remove the Battery from the insulation test equipment.

TASK 33-51-01-700-805-A00

5. FUNCTIONAL TEST

CAUTION: INCORRECT TEST EQUIPMENT ADJUSTMENTS CAN CAUSE DAMAGE TO THE BATTERY AND/OR TO THE EQUIPMENT.

CAUTION: MEASURE WITH ELECTRICALLY INSULATED EQUIPMENT.

CAUTION: USE ONLY PINS AS GIVEN IN FIG. 1001 TO CONNECT A TEST CIRCUITRY TO THE POSITIVE (+) AND NEGATIVE (–) CONTACT OF THE BATTERY IN ORDER TO PREVENT IRREVERSIBLE DAMAGE OF THE CONTACTS.

CAUTION: MAKE SURE THAT THE BATTERY TEMPERATURE IS STABLE IN THE RANGE OF +18 TO +30 °C [64 TO 86 °F].

NOTE: If necessary, apply forced cooling to the Battery or do the charge procedure and the capacity test in a temperature-controlled room.

NOTE: You can use discrete test components or the optional test equipment given in Table 1001.

SUBTASK 33-51-01-700-001-A00

A. TEST OF SEVERAL CIRCUITS

(1) Output Voltage

- Install the test circuitry given in FIG. 1002.
- Set the DMM to measure the DC voltage.
- Connect the DMM to the negative (–) Battery contact and to contact no. 6 of the Connector Module.
- Make sure that the voltage is more than 5.6 V.
- Disconnect the DMM from the Battery.

(2) Resistance of Heating Foil

(a) Set the DMM to measure the resistance.

(b) Connect the DMM to contact no. 1 and no. 4 of the Connector Module.

(c) Make sure that the resistance is between

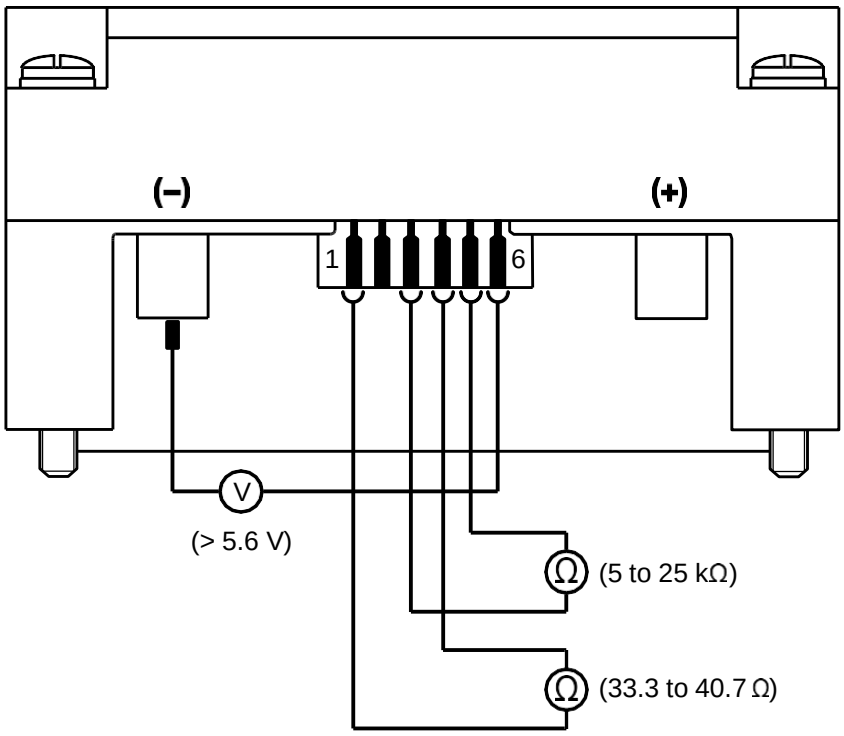
- 33.3 Ω and 40.7 Ω (Battery amendments "AMDT –" and "AMDT A"),
- 32.3 Ω and 41.7 Ω (Battery amendments "AMDT B" and later).

(d) Disconnect the DMM from the Battery.

NOTE: If the resistance is much higher, apply a current of max. 1 A for approximately 3 seconds between the contacts no. 1 and no. 2 of the connector. The current conduction will clean the contacts of the internal thermostat S1.

(3) Resistance of Temperature Sensor

- Set the DMM to measure the resistance.
- Connect the DMM to contact no. 3 and no. 5 of the Connector Module.
- Make sure that the resistance is between 5 kΩ and 25 kΩ (temperature-dependent).
- Disconnect the DMM from the Battery.



TEST CIRCUITRY
FIGURE 1002

SUBTASK 33-51-01-700-002-A00

B. STANDARD CHARGE PROCEDURE

NOTE: Keep a record (log report) of all charge procedures done to the Battery. Make sure that the report includes the serial number of the Battery and the date of charging.

(1) Refer to FIG. 1003 and install the standard charge circuitry.

NOTE: Make sure that the Battery temperature is less than or equal to 30 °C [86 °F].

(2) Set the current of the constant DC current source to 500 mA ± 20 mA and the maximum of the voltage limit to 7.8 V_{DC}.

(3) Connect the DC constant current source with two contact pins (Ref. FIG. 1001) to the positive (+) and negative (–) Battery contacts.

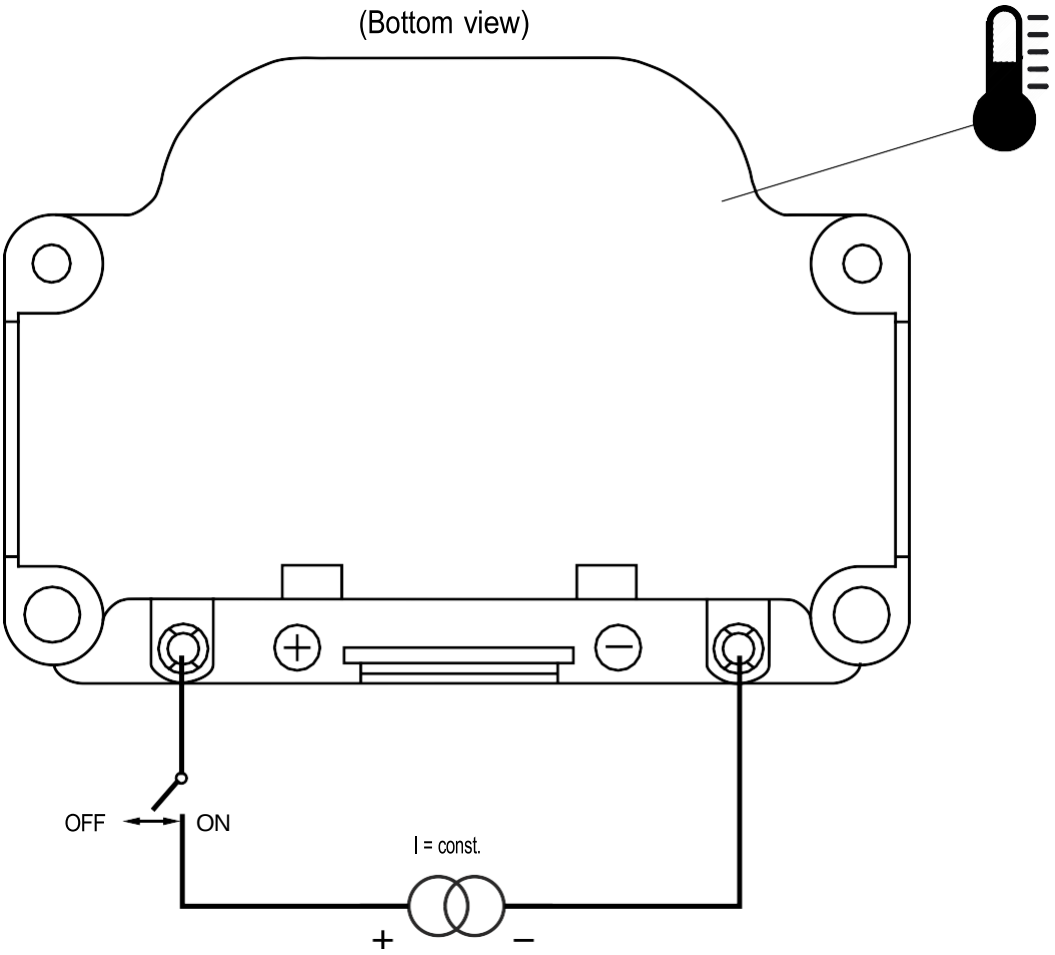
NOTE: Make sure that the polarity of the constant DC current source is correct.

(4) Switch the constant DC current source to ON position and charge the Battery for 16 hours.

(5) During the charge procedure monitor the temperature of the Battery housing. Stop immediately the charge procedure if the temperature is more than 45 °C [113 °F]. In

this case let the temperature of the Battery decrease to 25..30 °C [77..86 °F] and restart the charge procedure for one time. If the temperature of the Battery housing increases to more than 45 °C [113 °F] again, replace the Battery by a new one.

(6) At the end of the charge procedure disconnect the Battery from the charge circuitry.



STANDARD CHARGE CIRCUITRY
FIGURE 1003

SUBTASK 33-51-01-700-003-A00

C. OPTIONAL CHARGE PROCEDURE WITH EPSU

CAUTION: DO NOT DO THE OPTIONAL CHARGE PROCEDURE IF THE BATTERY HAS BEEN IN STORAGE FOR MORE THAN TWO MONTHS WITHOUT BEING TESTED (REF. CAPACITY TEST).

(1) You can use the Emergency Power Supply Unit (EPSU) as an alternative to keep a serviceable Battery charged e.g. after the capacity test.

NOTE: Make sure that the Battery temperature is less than or equal to 30 °C [86 °F].

(2) The procedure that follows keeps the Battery charged only. It is not a sufficient alternative to a full Battery test. The procedure is applicable to these EPSU part numbers:

- PNR 3301-54, 3301-54-10, 3301-54-20
- PNR 3301-55, 3301-55-10
- PNR 3301-62, 3301-62-10, 3301-62-20

(3) Refer to FIG. 1004 and install the optional charge circuitry with EPSU.

(4) Connect the Battery (2) to the EPSU (1).

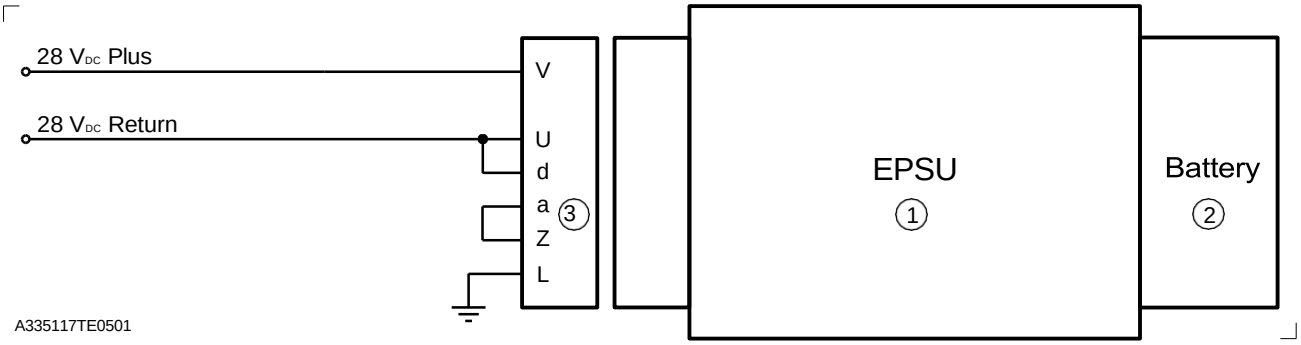
NOTE: For more data applicable to the EPSU refer to CMM 33-51-09 or CMM 33-51-12.

(5) Prepare the test cable using the 39-pole socket connector (3).

(6) Connect the EPSU to the 28 V_{DC} power supply.

(7) The total charge time depends on the state of charge of the Battery. It can take 2 to 3 hours to complete the procedure.

NOTE: The EPSU gives no visible feedback for a running or completed charge procedure.



OPTIONAL CHARGE CIRCUITRY WITH EPSU
FIGURE 1004

SUBTASK 33-51-01-700-006-A00

D. OPTIONAL FAST CHARGE PROCEDURE

CAUTION: DO NOT DO THE FAST CHARGE PROCEDURE BY DEFAULT. THE PROCEDURE CAUSES STRESS TO THE BATTERY.

DO NOT DO THE FAST CHARGE PROCEDURE IF THE BATTERY HAS BEEN IN STORAGE FOR MORE THAN TWO MONTHS WITHOUT BEING TESTED (REF. CAPACITY TEST).

(1) The Fast Charge Procedure is intended to give the maintenance personnel a possibility to fully charge the Battery after storage if it is immediately necessary for installation on aircraft or for the quick Capacity Test.

(2) Because the charge status of a Battery on stock is not known, only the -ΔU procedure can be recommended.

(3) Use a Battery charger that can do the -ΔU procedure, e.g. Battery Analyzer Type C7400ER or C7400ER C-Series as given in Table 1001.

(4) Table 1002 gives the parameters necessary for the Battery charger setup.

NOTE: All values for current, voltage, time and temperature are tolerated with ± 10 %.

PARAMETER	VALUE
Charge Current I_{charge}	4 A
Negative Voltage Slope Detection -ΔU	40...60 mV
Maximum Battery Voltage $U_{Battmax}$	7.8 V
Maximum Charge Time $T_{chargemax}$	105 Minutes
Temperature Range T_{Batt}	10...45 °C [50...113 °F]

PARAMETERS FOR BATTERY FAST CHARGER
TABLE 1002

SUBTASK 33-51-01-700-004-A00

E. CAPACITY TEST

CAUTION: MAKE SURE THAT THE BATTERY VOLTAGE DOES NOT DECREASE TO 5.6 V OR LESS TO PREVENT IRREVERSIBLE DAMAGE TO THE CELLS.

CAUTION: MAKE SURE THAT THE TEMPERATURE OF THE BATTERY HOUSING DOES NOT INCREASE TO MORE THAN 45 °C [113 °F].

NOTE: Start the capacity test 24 hours or less after the charge procedure.

NOTE: At the end of the capacity test the Battery is fully discharged.

(1) The capacity test makes sure that the Battery can supply sufficient electrical power for a specified period.

(2) Refer to FIG. 1005 and install the capacity test circuitry. Because of the high discharge current make sure that the leads are as short as possible.

(3) Set the DMM to measure the DC voltage.

(4) Set the automatic DC current sink to a constant current of 6.0 A_{DC}.

NOTE: Make sure that the Battery temperature is less than or equal to 30 °C [86 °F].

(5) Set the switch of the test circuitry to ON position to start the discharge operation. At the same time start the stop watch to measure the elapsed time.

NOTE: Look at the voltmeter and make sure that the voltage at the start of the discharge is equal to or more than 6 V and does not decrease to 5.6 V or less during the discharge operation.

(6) End of Test

(a) Battery amendments "AMDT –", "AMDT A" and "AMDT B":

1 When 20 minutes have elapsed and the Battery voltage is more than 5.6 V and the temperature of the Battery housing did not increase to more than 45 °C [113 °F] then the Battery has passed the capacity test.

2 When less than 20 minutes have elapsed and the Battery voltage is equal to or less than 5.6 V or the temperature of the Battery housing did increase to more than 45 °C [113 °F] then

- Let the temperature of the Battery decrease to 25..30 °C [77..86 °F].
- Do the Standard Charge Procedure.
- Let the temperature of the Battery decrease to 25..30 °C [77..86 °F].
- Restart the Capacity Test for one time.
- If the Battery does not pass the second capacity test then replace the defective Battery Block or discard the Battery.

(b) Battery amendments "AMDT C" and later:

1 When 30 minutes have elapsed and the Battery voltage is more than 5.6 V and the temperature of the Battery housing did not increase to more than 45 °C [113 °F] then the Battery has passed the capacity test.

2 When less than 30 minutes have elapsed and the Battery voltage is equal to or less than 5.6 V or the temperature of the Battery housing did increase to more than 45 °C [113 °F] then

- Let the temperature of the Battery decrease to 25..30 °C [77..86 °F].
- Do the Standard Charge Procedure.
- Let the temperature of the Battery decrease to 25..30 °C [77..86 °F].
- Restart the Capacity Test for one time.
- If the Battery does not pass the second capacity test then replace the defective Battery Block or discard the Battery.

(7) Set the switch of the test circuitry to OFF position

(8) Disconnect the Battery from the test circuitry.

(9) Partial Recharging Procedure

(a) At the end of the capacity test the Battery is discharged. Do the steps that follow before you transport the Battery or before you put the Battery to storage.

NOTE: Make sure that the Battery temperature is less than or equal to 30 °C [86 °F].

(b) Refer to FIG. 1003 and install the standard charge circuitry.

(c) Set the current of the constant DC current source to 500 mA ± 20 mA and the voltage limit to 7.8 V_{DC} maximum.

(d) Connect the DC constant current source with two contact pins (Ref. FIG. 1001) to the positive (+) and negative (–) Battery contacts.

NOTE: Make sure that the polarity of the constant DC current source is correct.

(e) Set the switch of the constant DC current source to ON position and charge the Battery for 3.5 ± 0.5 hours.

(f) Disconnect the Battery from the charge circuitry.

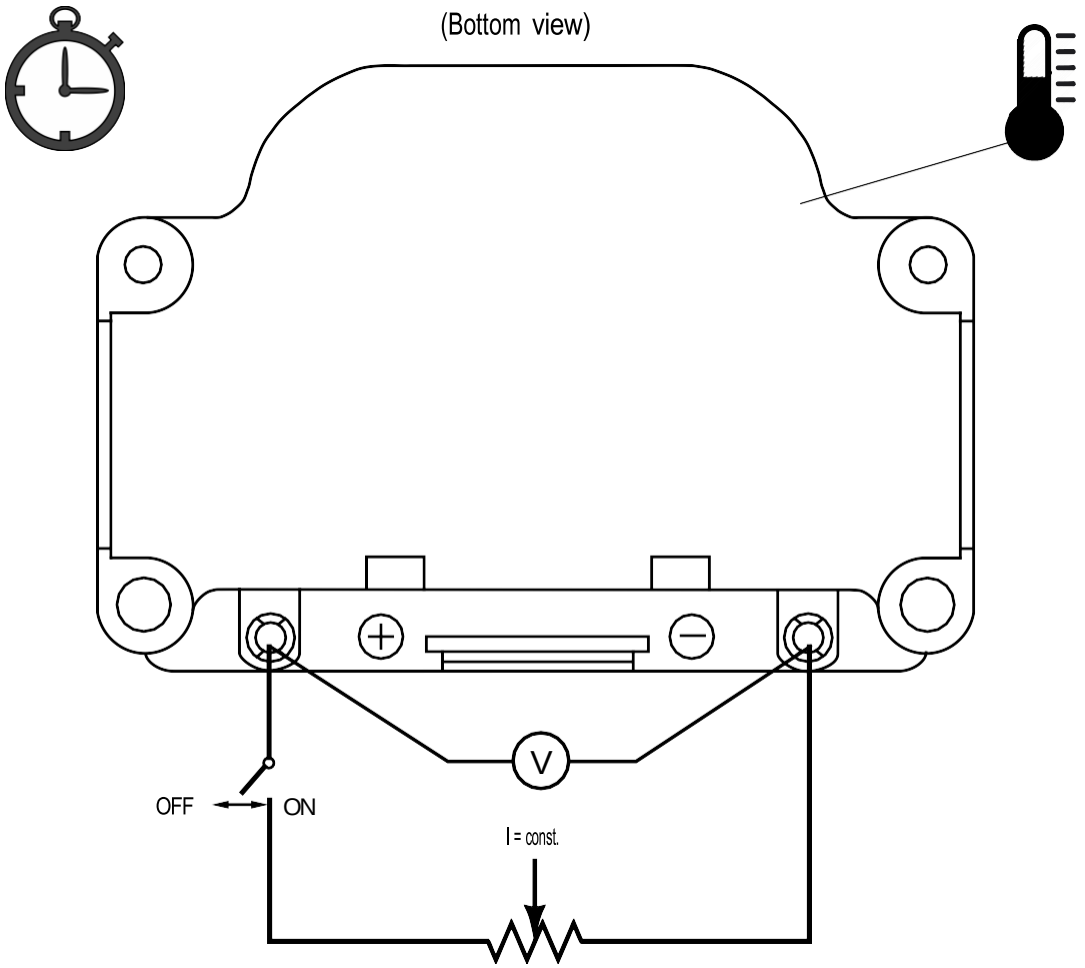
(g) Put the Battery to storage or prepare it for transport (refer to page block STORAGE).

(10) Optional Partial Fast Recharging Procedure

(a) The Partial Fast Recharging Procedure is an alternative to the Partial Recharging Procedure.

(b) Refer to subtask Optional Fast Charge Procedure and charge the Battery for 26 ± 4 minutes.

(c) Put the Battery to storage or prepare it for transport (refer to page block STORAGE).



CAPACITY TEST CIRCUITRY
FIGURE 1005

SUBTASK 33-51-01-700-005-A00

F. TEST OF THERMOSTAT

CAUTION: IN THE TEST THAT FOLLOWS, VERY HIGH TEMPERATURES WILL STRESS THE BATTERY. IT IS RECOMMENDED TO DO THIS TEST ONLY IF THERE IS THE SUBSTANTIAL SUSPICION OF A DEFECTIVE THERMOSTAT.

(1) Put the Battery into the climatic chamber.

(2) Increase the temperature of the chamber to 60 °C [140 °F] in 30 minutes or less and keep the temperature for a period of approximately 60 minutes.

(3) Set the DMM to measure the resistance.

(4) Remove the Battery from the climatic chamber and connect the DMM to the contacts no. 1 and no. 4 of the Connector Module.

(5) Make sure that the resistance is between 3.3 kΩ and 3.4 kΩ.

(6) Disconnect the DMM from the Battery and store the Battery at an ambient temperature of 15 to 20 °C [59 to 68 °F] for 2 hours minimum.

(7) Set the DMM to measure the resistance.

(8) Connect the DMM to contact no. 1 and no. 4 of the Connector Module.

(9) Make sure that the resistance is between

- 33.3 Ω and 40.7 Ω (Battery amendments "AMDT –" and "AMDT A"),
- 32.3 Ω and 41.7 Ω (Battery amendments "AMDT B" and later).

(10) Disconnect the DMM from the Battery.

TASK 33-51-01-700-806-A00

6. FAULT ISOLATION

A. General

(1) This section gives the fault isolation for the Battery, after the functional test has been done.

(2) Make sure that the external wiring is correct and the test set-up components are serviceable, before you start to disassemble the Battery.

B. Fault Isolation Chart

(1) Table 1002 gives the fault isolation chart for the Battery.

(2) The fault isolation chart helps you to find defective components and gives data about the probable cause of different faults and recommendations for corrective steps.

(3) Refer to the ILLUSTRATED PARTS LIST (IPL) for the item numbers given in the fault isolation chart.

FAULT	PROBABLE CAUSE	CORRECTION [1]
Insulation resistance out of tolerance	Short circuit between Heating Foil, Battery Block and/or other circuits	Examine Heating Foil and Battery Block and replace, if necessary
	Connector defective	Examine wiring and Connector Module. Replace Connector Module, if necessary
Resistance of Heating Foil out of tolerance	Connection between wiring and Connector Module (FIG. 1 - 80) defective	Examine wiring and Connector Module. Replace Connector Module, if necessary
	Heating Foil (FIG. 1 - 100) defective	Examine Heating Foil and replace, if necessary
Resistance of temperature sensor R2 out of tolerance	Temperature sensor defective	Examine Heating Foil and replace, if necessary
Voltage out of tolerance during capacity test	Capacity too low or Battery Block (FIG. 1 - 50) defective	Replace Battery Block
Battery keeps increasing specified temperature during charge procedure	Battery Block (FIG. 1 - 50) defective	Replace Battery Block
Battery fails test of thermostat S1	Thermostat defective	Replace Heating Foil

1) Applicable to Battery amendments "AMDT B" and later. For amendments "AMDT –" and "AMDT A" replace Battery.

FAULT ISOLATION CHART
TABLE 1003

DISASSEMBLY

TASK 33-51-01-99F-805-A00

1. GENERAL

A. This page block is applicable only to Battery amendments "AMDT B" and later. It gives step-by-step instructions on how to disassemble the Battery into its individual parts for maintenance and repair.

B. The disassembly is based on the ILLUSTRATED PARTS LIST (IPL) of this manual. Refer to the IPL for the item numbers given in the disassemble procedure.

TASK 33-51-01-940-802-A00

2. LIST OF TOOLS AND EQUIPMENT

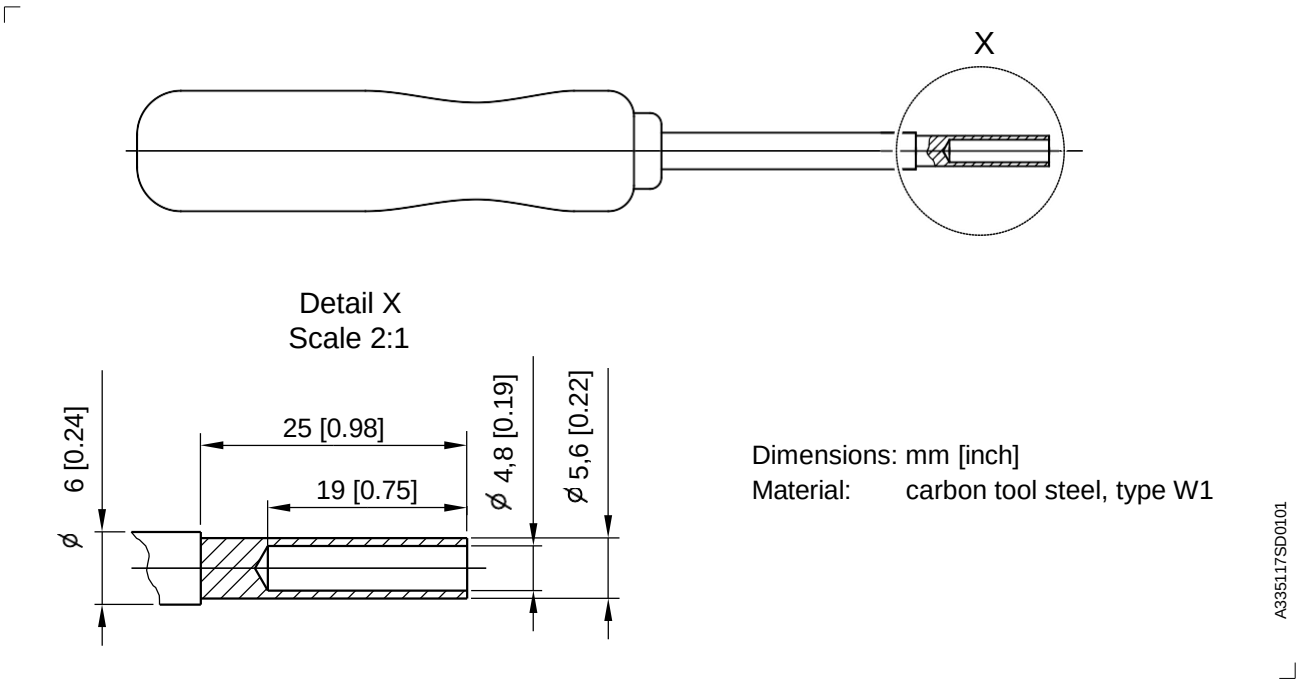
The equipment and tools given in Table 3001 are used in this page block.

NOTE: You can use equivalent alternatives for items in the list.

EQUIPMENT	SPECIFICATION OR PART NUMBER	SOURCE OR CAGE CODE
Extraction Tool	Ref. FIG. 3001	Make locally
Digital Multimeter (DMM)	True RMS, e.g. FLUKE 87V	Locally available
Power Resistor	0.88 Ω ± 2 %, 100 W 1)	Locally available
Or:		
Automatic DC Current Sink	6.0 A_{DC} const.	Locally available

1) 0.88 Ω is not a commercial available value. Use an adjustable resistor, if necessary.

LIST OF TOOLS AND EQUIPMENT
TABLE 3001



EXTRACTION TOOL
FIGURE 3001

TASK 33-51-01-000-801-A00

3. SET-UP

WARNING: **STRICTLY OBEY THE INSTRUCTIONS AND THE MATERIAL SAFETY DATA SHEET OF THE SUPPLIERS WHEN YOU USE THE TOOLS AND MATERIALS. REFER TO APPLICABLE INTERNATIONAL CHEMICAL SAFETY CARDS.**

CAUTION: FULLY CLEAN THE BATTERY BEFORE DISASSEMBLY TO PREVENT CONTAMINATION OF INTERNAL PARTS (REFER TO PAGE BLOCK CLEANING).

A. Refer to page blocks TESTING AND FAULT ISOLATION and CHECK to find the condition or the probable cause of a malfunction and to make an estimate of the level of disassembly and repair.

B. For an easy and correct reassembly

- identify components during disassembly,
- tag unmarked wires.

C. Before you start the disassembly procedure, discharge of the Battery is recommended to prevent damage to the Battery Block caused by accidental short circuits.

D. If it is necessary to discard the Battery Block, Total Discharge of the Battery is mandatory.

TASK 33-51-01-000-802-A00

4. DISCHARGE OF BATTERY

WARNING: **EVEN IF THE BATTERY HAS BEEN DISCHARGED, DO NOT SHORT-CIRCUIT THE BATTERY CELLS. THE REMAINING ENERGY IN THE BATTERY CELLS CAN CAUSE INJURY OF PERSONS AND DAMAGE TO EQUIPMENT.**

A. Do the discharge procedure as a precaution if you will use the Battery Block again after disassembly. Discharge prevents damage to the Battery Block caused by accidental short circuits.

NOTE: Make sure that the Battery temperature is less than or equal to 30 °C [86 °F].

B. Refer to FIG. 3002 and install the discharge circuitry. Because of the high discharge current make sure that the leads are as short as possible.

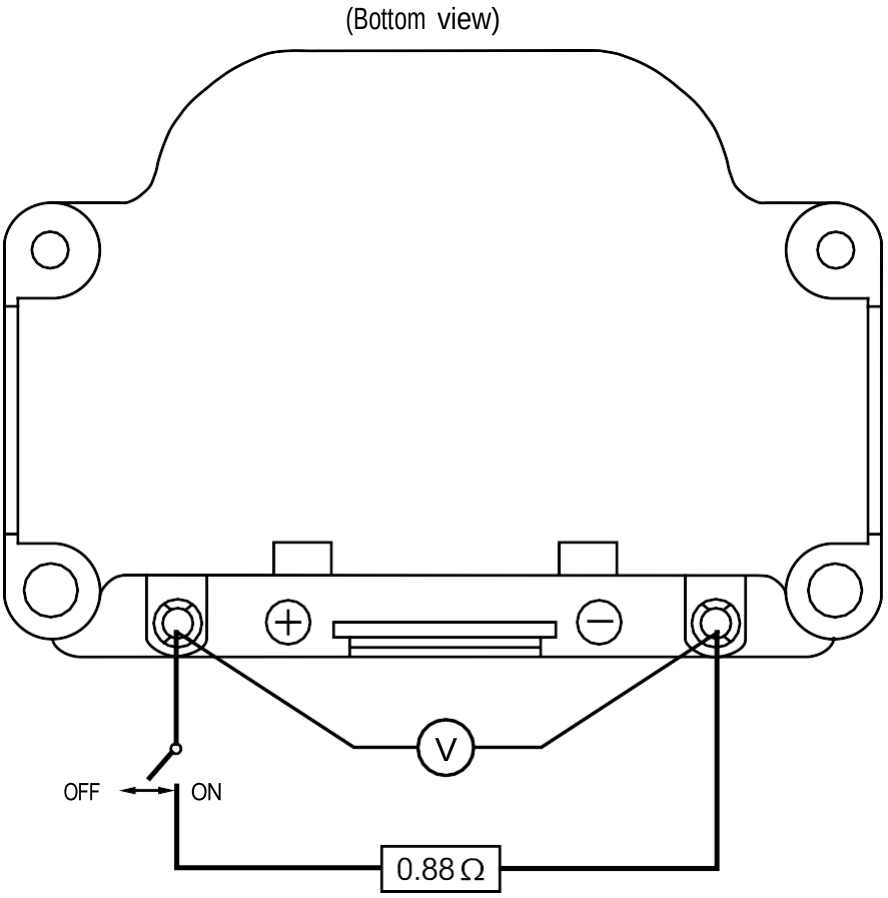
NOTE: You can use an automatic DC current sink with a constant current of 6.0 A_{DC} as an alternative to the power resistor.

C. Set the DMM to measure the DC voltage.

D. Set the switch of the test circuitry to ON position to start the discharge operation and monitor the voltmeter.

E. Stop immediately the discharge procedure when the Battery voltage is less than or equal to 5.6 V.

F. Remove the Battery from the discharge circuitry.



DISCHARGE CIRCUITRY
FIGURE 3002

TASK 33-51-01-000-803-A00

5. TOTAL DISCHARGE OF BATTERY

A. Do the total discharge procedure if you will discard the Battery Block.

B. Refer to FIG. 3002 and install the discharge circuitry. Because of the high discharge current make sure that the leads are as short as possible.

C. Set the DMM to measure the DC voltage.

D. Set the switch of the test circuitry to ON position to start the discharge operation and monitor the voltmeter.

E. Stop the total discharge procedure when the Battery voltage is less than 1 V.

F. Remove the Battery from the discharge circuitry.

NOTE: After total discharge, the Battery can no longer be used because the cells of the Battery Block are irreversibly unserviceable. Discard the Battery or replace the Battery Block by a new one.

TASK 33-51-01-000-804-A00

6. DISASSEMBLY PROCEDURE

WARNING: **DO NOT SHORT-CIRCUIT THE BATTERY CONTACTS TO PREVENT INJURY OF PERSONS AND DAMAGE TO EQUIPMENT.**

WARNING: **BEFORE DISPOSAL OF A DEFECTIVE BATTERY BLOCK DISCHARGE THE BATTERY FULLY.**

CAUTION: THE BATTERY BLOCK IS NOT REPAIRABLE. IT CONTAINS THE POLLUTANT CADMIUM. FOR DISPOSAL OBEY THE LOCAL AUTHORITY REGULATIONS.

CAUTION: ONLY DISASSEMBLE THE BATTERY

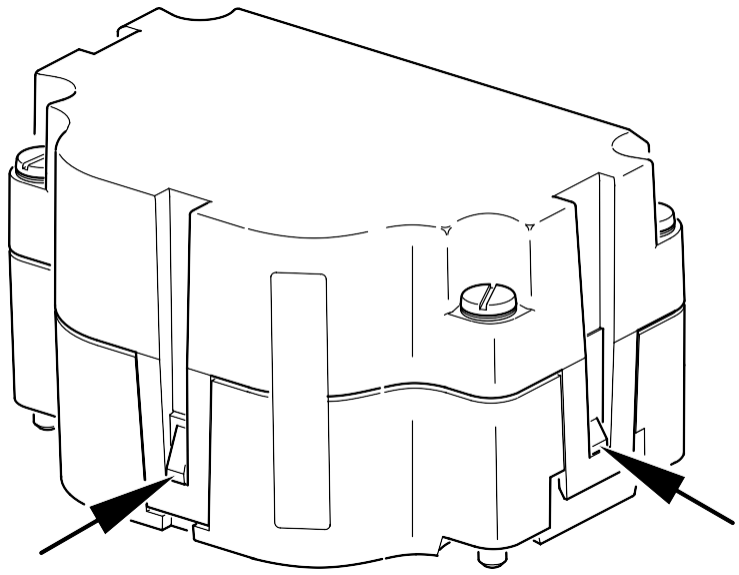
- IN A STANDARD WORKSHOP ENVIRONMENT,
- TO A LEVEL NECESSARY FOR REPAIR.

SUBTASK 33-51-01-000-001-A00

A. REMOVAL OF HOUSING

(1) Carefully lift the three tabs at the housing top (FIG. 1 - 10) at the same time to unlock the snap-in pins (Ref. FIG. 3003) of the housing bottom (FIG. 1 - 110).

(2) Remove the housing top (FIG. 1 - 10).



A335117ID0401

POSITION OF SNAP-IN PINS
FIGURE 3003

SUBTASK 33-51-01-000-002-A00

B. REMOVAL OF CONNECTOR MODULE

(1) Carefully pull the Connector Module (FIG. 1 - 80) out of the mounting slot in the housing bottom.

(2) Disconnect the 6-pole socket connector.

(3) Disconnect the 2-pole connector (FIG. 1 - 70).

(4) Remove the Connector Module (FIG. 1 - 80).

SUBTASK 33-51-01-000-003-A00

C. REMOVAL OF BATTERY BLOCK

CAUTION: IF THE BATTERY BLOCK IS NOT FULLY DISCHARGED AND WILL BE USED AGAIN, INSULATE THE CONTACTS WITH SELF-ADHESIVE TAPE TO PREVENT ACCIDENTAL CONNECTIONS DURING HANDLING.

CAUTION: DURING DISASSEMBLY HANDLE THE UNPROTECTED BATTERY BLOCK CAREFULLY TO PREVENT DAMAGE TO THE SENSITIVE INSULATION OF THE BATTERY CELLS.

(1) With the extraction tool remove the two contacts (FIG. 1 - 60) from the housing bottom.

(2) Remove the elastic rubber clamping (FIG. 1 - 40) from the Battery Block.

(3) Carefully pull the Battery Block (FIG. 1 - 50) out of the housing bottom (FIG. 1 - 110).

(4) Remove the Heating Foil (FIG. 1 - 100) from the Battery Block.

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CLEANING

TASK 33-51-01-99F-806-A00

1. GENERAL

WARNING: **STRICTLY OBEY THE INSTRUCTIONS AND THE MATERIAL SAFETY DATA SHEET OF THE SUPPLIERS WHEN YOU USE THE TOOLS AND MATERIALS. REFER TO APPLICABLE INTERNATIONAL CHEMICAL SAFETY CARDS.**

A. This page block gives step-by-step instructions on how to clean the assembled or disassembled Battery, specific areas of the Battery and its parts.

B. For more data refer to page block SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES.

TASK 33-51-01-940-803-A00

2. LIST OF TOOLS AND EQUIPMENT

The equipment and tools given in Table 4001 are used in this page block.

NOTE: You can use equivalent alternatives for items in the list.

EQUIPMENT	SPECIFICATION OR PART NUMBER	SOURCE OR CAGE CODE
Low-lint Cloth	A-A-59323, Type 2	Locally available
Nonmetallic Soft-bristle Brush	Anti-static	Locally available

LIST OF TOOLS AND EQUIPMENT
TABLE 4001

TASK 33-51-01-94A-801-A00

3. LIST OF MATERIALS

The materials given in Table 4002 are used in this page block.

NOTE: You can use equivalent alternatives for items in the list.

ITEM	SPECIFICATION OR PART NUMBER	SOURCE OR CAGE CODE
Compressed Air	No special	Locally available
Isopropyl Alcohol	CAS Reg. No. 67–63–0 MIL TT-I-735A, Grade A	Locally available

LIST OF MATERIALS
TABLE 4002

TASK 33-51-01-100-801-A00

4. SET-UP

A. Parts Protection

(1) If applicable, disconnect the Battery from the Battery charger or the test equipment before cleaning.

(2) If you do not examine the cleaned parts immediately, protect the parts from damage and contamination.

TASK 33-51-01-100-802-A00

5. PROCEDURE

WARNING: **DO NOT GET CLEANING AGENTS ON YOUR SKIN, IN YOUR EYES, OR NEAR A FLAME. DO NOT BREATHE THE FUMES. THERE MUST BE A GOOD AIRFLOW IN THE WORK AREA.**

WARNING: **CLEANING AGENTS ARE POISONOUS AND FLAMMABLE. DO NOT DRINK SOLVENTS AND CLEANING AGENTS. FLUSH IRRITATED EYES WITH WATER. DO NOT SMOKE.**

WARNING: **WEAR SAFETY GOGGLES OR GLASSES WHEN YOU USE COMPRESSED AIR. POINT THE AIRFLOW AWAY FROM OTHER PERSONS.**

CAUTION: USE ONLY SPECIFIED CLEANING MATERIALS OR APPLICABLE ALTERNATIVES. OBEY THE MANUFACTURER'S INSTRUCTIONS. THE USE OF INCORRECT MATERIALS CAN CAUSE DAMAGE TO THE SURFACE PROTECTION.

CAUTION: REMOVE ALL CLEANING AGENTS FROM THE PARTS BEFORE YOU DO THE ASSEMBLE PROCEDURE. CLEANING AGENTS CAN CAUSE CORROSION.

CAUTION: CLEAN THE ELECTRICAL COMPONENTS AND THE CONNECTORS CAREFULLY TO PREVENT DAMAGE.

CAUTION: DO NOT REMOVE THE COMPONENT IDENTIFICATION.

SUBTASK 33-51-01-100-001-A00

A. CLEANING OF CONNECTOR MODULE

If necessary, clean the electrical contacts of the Connector Module with a small, nonmetallic soft-bristle brush (anti-static) and Isopropyl Alcohol.

SUBTASK 33-51-01-100-002-A00

B. CLEANING OF HOUSING

(1) Remove stubborn contamination by rubbing with a clean low-lint cloth or a nonmetallic soft-bristle brush (anti-static) and Isopropyl Alcohol.

(2) Clean and dry the housing with filtered, compressed air.

CHECK

TASK 33-51-01-99F-807-A00

1. GENERAL

A. This page block is applicable only to Battery amendments "AMDT B" and later. It gives step-by-step instructions that are necessary during shop maintenance of the disassembled Battery to make sure that the parts are serviceable and the inter-relationship of the parts is correct.

B. For repair of defective modules refer to page block REPAIR.

C. For replacement of parts refer to page blocks DISASSEMBLY and ASSEMBLY.

TASK 33-51-01-220-801-A00

2. VISUAL INSPECTION

CAUTION: DO THE VISUAL CHECK OF THE COMPONENTS BEFORE YOU ASSEMBLE THE BATTERY. REFER TO THE ILLUSTRATED PARTS LIST (IPL) FOR THE ITEM NUMBERS GIVEN IN THE SUBTASKS THAT FOLLOW.

NOTE: No special procedures are required. Use standard industry practices.

SUBTASK 33-51-01-220-001-A00

A. OVERALL CONDITION

(1) Visually examine the overall condition of the Battery. Record findings for later corrective steps.

(2) Usual signs of wear and tear which have no effects on the usability of the Battery are permitted.

SUBTASK 33-51-01-220-002-A00

B. CHECK OF CONNECTOR MODULE AND CONTACTS

(1) Examine the contacts of the Connector Module (FIG. 1 - 80).

(2) Make sure that the contacts are clean and there are no signs of abrasion and corrosion.

(3) Examine the 2-pole connector (FIG. 1 - 70) and the 6-pole socket connector of the Connector Module. Make sure that the connectors are plugged in correctly.

(4) Examine the two contacts of the positive (+) and the negative (–) Battery terminal (FIG. 1 - 60).

(5) Make sure that

- the contacts are clean,
- there are no signs of corrosion, damage and overheating,
- the contacts are correctly attached to the Battery housing.

SUBTASK 33-51-01-220-003-A00

C. CHECK OF BATTERY HOUSING

(1) Examine the Battery housing for dents, nicks, cracks, cuts and other obvious defects.

(2) Make sure that there are no signs of

- effects caused by handling.
- thermal damage.

(3) Examine the Battery for completeness of parts.

(4) Make sure that the top (FIG. 1 - 10) and the bottom (FIG. 1 - 110) of the Battery housing are snapped in correctly when the Battery is assembled.

(5) Examine the identification and modification labels. Make sure that

- the labels are correctly attached,
- you can read them.

SUBTASK 33-51-01-220-004-A00

D. VISUAL CHECK OF BATTERY CELLS

NOTE: This subtask is applicable to Battery "AMDT C" only.

(1) Fully examine the insulation of the Battery cells adjacent to the angled welded connector. If necessary use a magnifying glass.

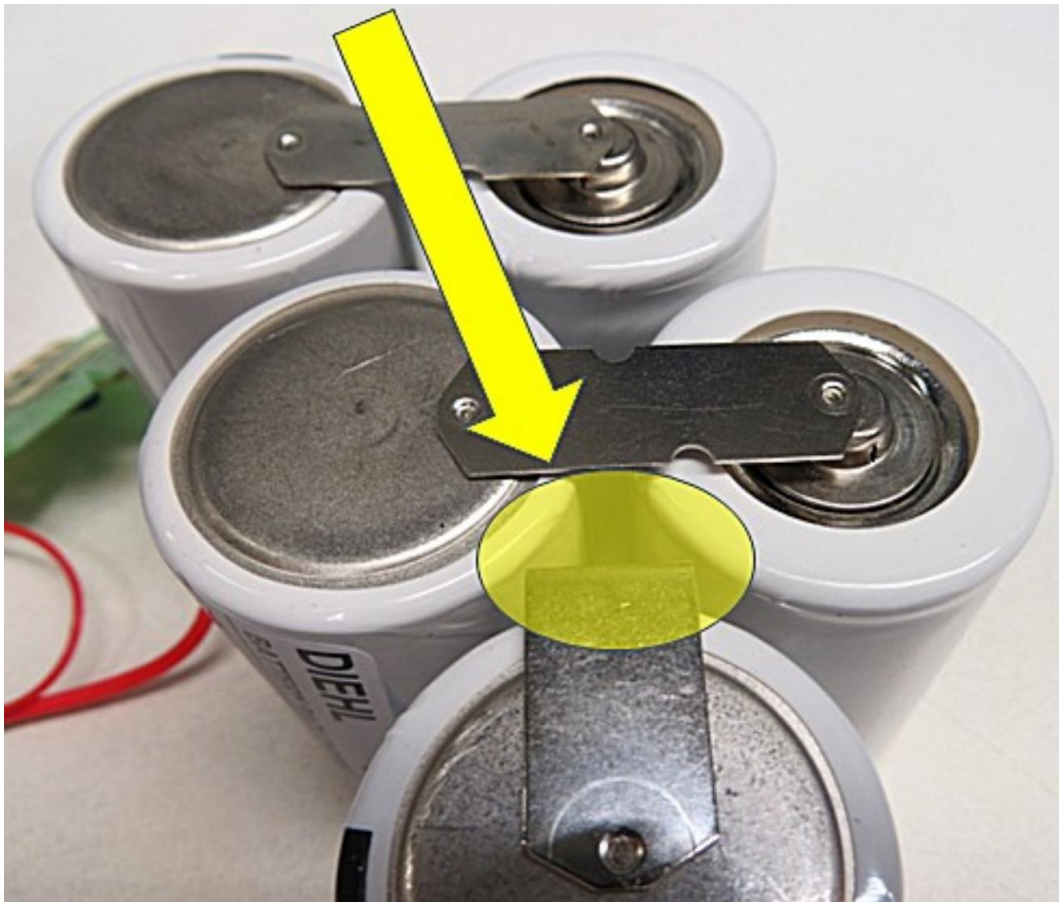
(2) Make sure that

- the insulation is fully intact,
- there are no cuts, scratches or signs of abrasion,
- there are no signs of damage and overheating.

NOTE: Micro scratches with lesser depth not reaching the metallic surface of the Battery cells are permitted.

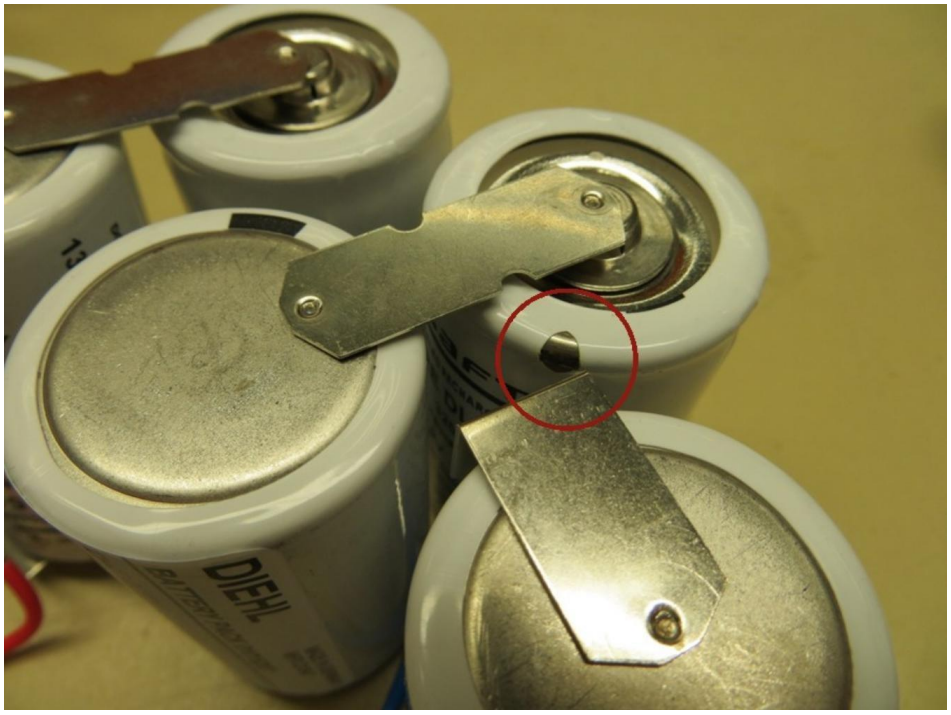
NOTE: Surface variations of the heat shrink of the Battery cells are normal and permitted.

(3) FIG. 5001 gives the relevant inspection area.



RELEVANT INSPECTION AREA
FIGURE 5001

(4) FIG. 5002, FIG. 5003 and FIG. 5004 give examples of unsatisfactory defective cell insulation with visible metal housing.



DEFECTIVE CELL INSULATION: EXAMPLE 1
FIGURE 5002

DEFECTIVE CELL INSULATION: EXAMPLE 2
FIGURE 5003

DEFECTIVE CELL INSULATION: EXAMPLE 3
FIGURE 5004

(5) The subsequent procedure depends on the results of the visual check:

VISUAL CHECK PASSED?	FINDINGS	CONTINUE WITH
Yes	None	Case 1
No	Defective Battery cell insulation with visible metal housing (Ref. FIG. 5002, FIG. 5003, FIG. 5004)	Case 2
No	Signs of overheating, melt points or traces of melting	Case 3

TABLE 5001

(6) Case 1: Visual Check Passed

(a) It is recommended to do the modification from "AMDT C" to "AMDT D" (new housing bottom) even if the Battery passed the visual check. The improved housing bottom prevents the Battery cells from mutual contact caused by unusual shock stresses e.g. during transport.

(b) To incorporate "AMDT D" continue with Case 2.

(c) End of visual check.

(7) Case 2: Modification to "AMDT D"

(a) Replace the housing bottom of the Battery by the new housing bottom applicable to Battery "AMDT D" and later (FIG. 1 - 110).

(b) Change the AMDT letter given on the type plate of the Battery from "AMDT C" to "AMDT D".

(c) Refer to page block ASSEMBLY and reassemble the Battery.

(8) Case 3: Scrapping

(a) Refer to task Total Discharge of Battery in page block DISASSEMBLY and discharge the Battery Block fully.

(b) Discard the Battery.

(c) Cut off the positive (+) and the negative (–) cable.

NOTE: The cells of the Battery Block contain the pollutant Cadmium. For disposal obey the local authority regulations.

REPAIR

TASK 33-51-01-99F-808-A00

1. GENERAL

WARNING: **STRICTLY OBEY THE INSTRUCTIONS AND THE MATERIAL SAFETY DATA SHEET OF THE SUPPLIERS WHEN YOU USE THE TOOLS AND MATERIALS. REFER TO APPLICABLE INTERNATIONAL CHEMICAL SAFETY CARDS.**

A. This page block is applicable only to Battery amendments "AMDT B" and later. It gives instructions and specifications necessary to repair a worn or defective Battery to a serviceable condition.

B. The repair procedure gives the instructions for the replacement of unserviceable components found during the CHECK and TESTING AND FAULT ISOLATION procedures. It does not give standard practices, for example soldering and track repair or replacement of surface mounted devices. Use local standard procedures.

C. Obey the applicable specifications given in TABLE 6001 when you do the repair instructions. The specifications are available with costs e.g. in the online store of IPC, the Association Connecting Electronics Industries.

SPECIFICATION	TITLE
IPC-7711/7721 1)	Rework, Modification and Repaier of Electronic Assemblies
IPC-A-610 1)	Acceptability of Electronic Assemblies
IPC-J-STD-001	Requirements for Soldered Electrical and Electronic Assemblies
IPC-J-STD-004	Requirements for Soldering Fluxes
IPC-J-STD-006	Requirements for Electronic Grade Solder Alloys and Fluxed and Non-Fluxed Solid Solders for Electronic Soldering Applications

1) Appropriate class=Class 3 (high performance electronic products)

REPAIR SPECIFICATIONS
TABLE 6001

D. The repair is based on the ILLUSTRATED PARTS LIST (IPL) of this manual. Refer to the IPL for the item numbers given in the repair procedure.

E. No fixtures, special tools and equipment are necessary for repair.

TASK 33-51-01-94A-802-A00

2. LIST OF MATERIALS

The materials given in Table 6002 are used in this page block.

NOTE: You can use equivalent alternatives for items in the list.

ITEM	SPECIFICATION OR PART NUMBER	SOURCE OR CAGE CODE
Solder Wire Sn63Pb37 or Sn60Pb40 with halogen-free flux core	Ref. IPC-J-STD-006	Locally available

LIST OF MATERIALS
TABLE 6002

TASK 33-51-01-300-801-A00

3. SET-UP

A. If applicable, disconnect the Battery from the Battery charger or the test equipment before repair.

B. Refer to page blocks TESTING AND FAULT ISOLATION and CHECK to find the condition or the probable cause of a malfunction and to make an estimate of the level of repair.

TASK 33-51-01-300-802-A00

4. PROCEDURE

CAUTION: ONLY REPAIR THE BATTERY IN A STANDARD WORKSHOP ENVIRONMENT.

SUBTASK 33-51-01-300-002-A00

A. REPLACEMENT OF BATTERY SUB-ASSEMBLIES

(1) Refer to page block DISASSEMBLY and disassemble the Battery.

(2) Remove the applicable sub-assembly

- Battery Block (FIG. 1 - 50) or
- Connector Module (FIG. 1 - 80) or
- Heating Foil (FIG. 1 - 100).

(3) Install the replacement sub-assembly.

(4) Refer to page block ASSEMBLY and assemble the Battery.

SUBTASK 33-51-01-300-005-A00

B. MODIFICATION STATUS CHECK

(1) Check in the IPL if the repair has an effect on the modification status of the Battery.

(2) If applicable, mark the identification label of the Battery with the correct AMDT code. Refer to page block DESCRIPTION AND OPERATION for details on modification status labeling.

SUBTASK 33-51-01-300-006-A00

C. RETURN-TO-SERVICE TEST

Refer to page block TESTING AND FAULT ISOLATION and do the Capacity Test before you put the Battery back to service or into storage.

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TASK 33-51-01-99F-809-A00

1. GENERAL

A. This page block is applicable only to Battery amendments "AMDT B" and later. It gives step-by-step instructions on how to assemble the disassembled Battery during shop maintenance and/or after repair.

B. The assembly is based on the ILLUSTRATED PARTS LIST (IPL) of this manual. Refer to the IPL for the item numbers given in the assembly procedure.

TASK 33-51-01-400-801-A00

2. SET-UP

WARNING: **STRICTLY OBEY THE INSTRUCTIONS AND THE MATERIAL SAFETY DATA SHEET OF THE SUPPLIERS WHEN YOU USE THE TOOLS AND MATERIALS. REFER TO APPLICABLE INTERNATIONAL CHEMICAL SAFETY CARDS.**

A. Examine Parts

(1) Examine the parts and make sure that they are serviceable and clean.

(2) Make sure that the parts have the correct part number.

(3) No fixtures, special tools and equipment are necessary for assembly.

(4) No consumable materials are necessary for assembly.

TASK 33-51-01-400-802-A00

3. PROCEDURE

CAUTION: ONLY ASSEMBLE THE BATTERY IN A STANDARD WORKSHOP ENVIRONMENT. DO THE ASSEMBLY ON A SOFT, CLEAN WORK SURFACE TO PREVENT DAMAGE TO THE COMPONENTS.

CAUTION: DURING ASSEMBLY HANDLE THE UNPROTECTED BATTERY BLOCK CAREFULLY TO PREVENT DAMAGE TO THE SENSITIVE INSULATION OF THE BATTERY CELLS.

NOTE: For "AMDT C" Battery only:

It is recommended to replace the housing bottom of the Battery by the housing bottom PNR 0001028681. The improved housing bottom prevents the Battery cells from mutual contact caused by unusual shock stresses e.g. during transport.

In this case change the AMDT letter given on the type plate of the Battery from "AMDT C" to "AMDT D".

A. Put the Heating Foil (FIG. 1 - 100) into the empty housing bottom (FIG. 1 - 110). Make sure that the position of the foil approximately fits the outline of the Battery Block (Ref. FIG. 7001).

B. Put the thermostat S1 and the temperature sensor R2 into the related location (Ref. FIG. 7001).

C. Carefully install the Battery Block (FIG. 1 - 50). Make sure that the Battery cells do not bend or cause damage to the Heating Foil.

D. Connect the 2-pole connector (FIG. 1 - 70) to the Connector Module (FIG. 1 - 80).

E. Connect the 6-pole socket connector of the Heating Foil to the Connector Module.

F. Put the Connector Module (FIG. 1 - 80) into the mounting slot of the housing bottom.

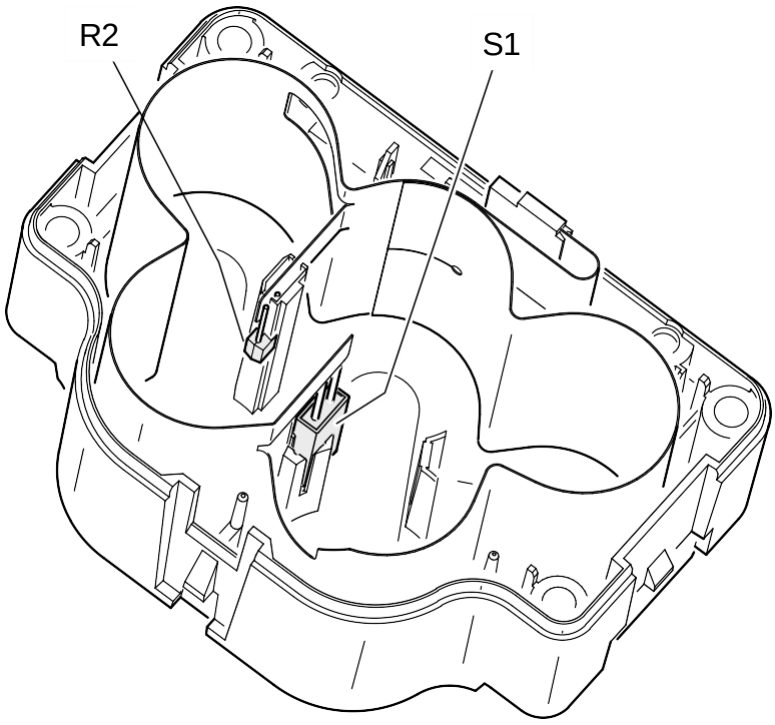
G. With an applicable tool (e.g. tweezers) compress the spring area of the positive (red cable) terminal contact (FIG. 1 - 60) and at the same time press it into the related bore of the housing bottom. Make sure that the contact is correctly locked.

H. Put the negative (blue cable) terminal contact (FIG. 1 - 60) through the elastic rubber clamping (FIG. 1 - 40). With an applicable tool (e.g. tweezers) compress the spring area of the contact and at the same time press it into the related bore of the housing bottom. Make sure that the contact is correctly locked.

I. Put the rubber clamping (FIG. 1 - 40) on the Battery Block (FIG. 1 - 50) and adjust the struts correctly.

J. Put the housing top (FIG. 1 - 10) on the housing bottom (FIG. 1 - 110). Carefully apply a light force until the snap-in pins are locked correctly.

NOTE: Make sure that the Connector Module (FIG. 1 - 80) keeps in a right-angled position during the assembly of the Battery housing. Use an applicable assembling device, if necessary.



A335117ID0601

INSTALLATION OF THERMOSTAT S1 AND TEMPERATURE SENSOR R2
FIGURE 7001

TASK 33-51-01-400-803-A00

4. RETURN-TO-SERVICE TEST

Refer to page block TESTING AND FAULT ISOLATION and do the Capacity Test before you put the Battery back to service or into storage.

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SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES

TASK 33-51-01-940-807-A00

1. LIST OF TOOLS AND EQUIPMENT

Table 9001 gives the tools and equipment necessary to do all the maintenance procedures for the Battery given in this CMM.

NOTE: Unless specified differently, you can use equivalent alternatives for items in the list.

EQUIPMENT	SPECIFICATION OR PART NUMBER	SOURCE OR CAGE CODE	USED IN				
			TFI	DIS	CLE	SPR	STO
DC Power Supply	1 - 10 V, adjustable ± 0.5 V 0.05 - 0.5 A, adjustable ± 0.02 A	Locally available	X				
Insulation Test Equipment	500 VDC ± 10 V 10 - 100 MΩ	Locally available	X				
Digital Multimeter (DMM)	True RMS (e.g. FLUKE 87V)	Locally available	X	X			
Automatic DC Current Sink	6.0 A_{DC} const.	Locally available	X	X			
Climatic Chamber	Temperature adjustable 10 to 60 °C [50 to 140 °F]	Locally available	X				
Stop Watch	Elapsed time: 1 to 30 minutes	Locally available	X				
Contact Pin	PNR 0000402673 (2 ea.) (Ref. FIG. 1001)	D1347	X				
Option:							
Connector 39-pole, sockets [1]	e.g. PNR 851-00R20-39S50	F0225	X				
Option:							
Battery Analyzer	Type C7400ER or C7400ER C-Series	D1347	X			X	
Adapter	PNR 07-110-9200 (1-4 ea.)	D1347	X			X	
Software [3]	Battery 1 Shop Software Version 6.x.....x	D1347	X			X	
Or:							
Battery Charge Adapter [2]	PNR EP4-025-67B	D1347	X				
Discharge Test Set [2]	PNR EP4-025-57.1A	D1347	X				
Extraction Tool	Ref. FIG. 3001	Make locally		X			
Power Resistor [4]	0.88 Ω ± 2 %, 100 W	Locally available		X			
Low-lint Cloth	A-A-59323, Type 2	Locally available			X		X

LIST OF TOOLS AND EQUIPMENT
TABLE 9001 (continued on next page)

EQUIPMENT	SPECIFICATION OR PART NUMBER	SOURCE OR CAGE CODE	USED IN				
			TFI	DIS	CLE	SPR	STO
Nonmetallic Soft-bristle Brush	Anti-static	Locally available			X		
Identification Label	No special	Locally available					X
Battery Packaging	PNR 0001028820	D1347					X

1) For optional charge procedure with EPSU only

2) Not procurable (out of production)

3) Refer to Vendor Service Information Letter D1347-33-035 for latest software version

4) 0.88 Ω is not a commercial available value. Use an adjustable resistor, if necessary.

LIST OF TOOLS AND EQUIPMENT
TABLE 9001

TASK 33-51-01-94A-805-A00

2. LIST OF MATERIALS

The materials given in Table 9002 are necessary for the maintenance of the Battery.

NOTE: You can use equivalent alternatives for items in the list.

ITEM	SPECIFICATION OR PART NUMBER	SOURCE OR CAGE CODE	USED IN		
			CLE	REP	STO
Compressed Air	No special	Locally available	X		
Isopropyl Alcohol	CAS Reg. No. 67–63–0 MIL TT-I-735A, Grade A	Locally available	X		
Solder Sn63Pb37 or Solder Sn60Pb40	Ref. IPC-J-STD-006	Locally available		X	
Air-cushion Sheeting	No special	Locally available			X
Self-adhesive Tape	No special	Locally available			X

LIST OF MATERIALS
TABLE 9002

SPECIAL PROCEDURES

TASK 33-51-01-99F-811-A00

1. GENERAL

A. This page block gives optional instructions on how to keep the Battery in fully charged condition for a specified period.

B. The charge procedure given in task "Trickle Charge" compensates the self-discharge of the Battery in storage. The procedure uses a continuous charging current that is high enough to keep the Battery fully charged and low enough to keep the temperature and the internal pressure of the NiCd cells at a safe level.

TASK 33-51-01-940-808-A00

2. LIST OF TOOLS AND EQUIPMENT

The equipment and tools given in Table 11001 are used in this page block.

NOTE: You can use equivalent alternatives for items in the list.

EQUIPMENT	SPECIFICATION OR PART NUMBER	SOURCE OR CAGE CODE
Battery Analyzer	Type C7400ER or C7400ER C-Series	D1347
Adapter	PNR 07-110-9200 (1-4 ea.)	D1347
Software	Battery 1 Shop Software, V 6.x...7.x 1)	D1347

1) Refer to Vendor Service Information Letter D1347-33-035 for latest software version

LIST OF TOOLS AND EQUIPMENT
TABLE 11001

TASK 33-51-01-860-801-A00

3. TRICKLE CHARGE

A. The Battery can be trickle charged for maximum 6 months between two capacity tests done one after the other.

B. Make sure that the Battery is fully charged before you start the trickle charge. If necessary do a Standard Charge Procedure first (Ref. page block TESTING AND FAULT ISOLATION).

C. Under workshop environmental conditions do the trickle charge procedure with the Battery connected to a constant current source. Make sure that the charge current is between 140 mA and 160 mA (U_{Batmax} = 7.5 V − 0.2 V_{DC}).

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TASK 33-51-01-99F-816-A00

1. GENERAL

This page block gives data to prepare the Battery for transportation, special handling, packaging, storage and preservation after ASSEMBLY or TESTING AND FAULT ISOLATION.

TASK 33-51-01-940-806-A00

2. LIST OF TOOLS AND EQUIPMENT

The equipment and tools given in Table 15001 are used in this page block.

NOTE: You can use equivalent alternatives for items in the list.

EQUIPMENT	SPECIFICATION OR PART NUMBER	SOURCE OR CAGE CODE
Identification Label	No special	Locally available
Low-lint Cloth	A-A-59323, Type 2	Locally available
Battery Packaging	PNR 0001028820	D1347

LIST OF TOOLS AND EQUIPMENT
TABLE 15001

TASK 33-51-01-94A-804-A00

3. LIST OF MATERIALS

The materials given in Table 15002 are used in this page block.

NOTE: You can use equivalent alternatives for items in the list.

ITEM	SPECIFICATION OR PART NUMBER	SOURCE OR CAGE CODE
Air-cushion Sheeting	No special	Locally available
Self-adhesive Tape	No special	Locally available

LIST OF MATERIALS
TABLE 15002

TASK 33-51-01-550-802-A00

4. SET-UP

CAUTION: MAKE SURE THAT ALL PERSONS WHO HANDLE AND USE THE BATTERY FULLY KNOW THE PRECAUTIONS AND PROCEDURES GIVEN IN THIS PAGE BLOCK.

CAUTION: DO NOT STORE THE BATTERY NEAR A SOURCE OF HEAT.

CAUTION: DO NOT THROW THE BATTERY INTO A FIRE, OR PLACE IT IN AN OVEN, STOVE, MICROWAVE OVEN OR A DIFFERENT HEATING APPLIANCE.

CAUTION: DO NOT DROP OR THROW THE BATTERY OR SUBJECT IT TO EXCESSIVE IMPACT OR SHOCK.

CAUTION: DO NOT LET THE BATTERY COME INTO CONTACT WITH WATER, AQUEOUS SOLUTIONS OR OTHER LIQUIDS.

A. Make sure that the Battery is in storage condition, i.e. status after Capacity Test with subsequent Partial Recharging Procedure as given in page block TESTING AND FAULT ISOLATION.

B. Clean the Battery with a clean and dry low-lint cloth.

TASK 33-51-01-550-803-A00

5. PROCEDURE

SUBTASK 33-51-01-530-001-A00

A. PACKING

(1) Put the Battery into the Battery Packaging PNR 0001028820. Use the initial material for the protection of the Battery.

(2) Make sure that the Battery cannot move in the packaging.

(3) Seal the packaging with self-adhesive tape.

(4) Put an identification label on the packaging.

(5) Make sure that

- the identification label has all the related data of the Battery,
- you can read the label easily.

SUBTASK 33-51-01-550-001-A00

B. STORAGE

CAUTION: MAKE SURE THAT THERE IS NOT TOO MUCH WEIGHT ON THE PACKAGING IN STORAGE. TOO MUCH WEIGHT ON THE PACKAGING CAN CAUSE DAMAGE TO THE BATTERY.

CAUTION: DO NOT KEEP THE PACKAGING NEAR FLUIDS THAT CAN CAUSE CORROSION OR DAMAGE. DO NOT KEEP THE PACKAGING NEAR SOURCES THAT MAKE HEAT OR OZONE.

CAUTION: DO NOT PUT A BATTERY INTO STORAGE THAT IS FULLY CHARGED. MAKE SURE THAT THE CHARGE LEVEL OF THE BATTERY IS BETWEEN 1.5 AND 2 AH.

(1) Keep the packaging in a shelf of a clean, dry room with a good supply of air. Make sure that the air in the room is free of aggressive fumes or gases which have an unwanted effect on the packing material and cause corrosion of the Battery.

(2) Keep the room temperature between -40 °C (-40 °F) and +50 °C (122 °F) with an annual average of +10 °C (50 °F) to +25 °C (77 °F).

(3) Make sure that the relative humidity is ≤ 95 % at 40 °C (104 °F), non-condensing.

(4) Make sure that you can read easily the identification label of the stored packaging.

(5) At intervals of 6 months do a Capacity Test with subsequent Partial Recharging Procedure as given in page block TESTING AND FAULT ISOLATION to keep the Battery in serviceable condition.

SUBTASK 33-51-01-510-001-A00

C. SHIPPING

(1) For transport, put the Battery into the Battery Packaging PNR 0001028820.

(2) Do not ship the Battery in its cushioning inner packaging only. Always use applicable outer packaging.

TASK 33-51-01-540-801-A00

6. POST-PROCEDURE

SUBTASK 33-51-01-540-001-A00

A. REMOVAL FROM STORAGE

(1) If possible, obey these recommendations:

- Do not use the Battery immediately after storage if there is a large difference of temperature or humidity between the locations of storage and use.
- Let the Battery stay in the environmental conditions at the location of use for approximately two hours before you put it to service.

(2) Unpack the Battery from the storage packaging.

NOTE: If the packaging is not defective, you can keep it and use it again.

(3) Do a Capacity Test with subsequent charging procedure as given in page block TESTING AND FAULT ISOLATION.

NOTE: The Capacity Test is not necessary if less than two months have passed after the last Capacity Test.

(4) Put the Battery to service.

SUBTASK 33-51-01-540-002-A00

B. DISPOSAL

(1) The Battery contains the pollutant Cadmium. For disposal obey the local authority regulations.

(2) Before disposal, do a Total Discharge of the Battery as given in page block DISASSEMBLY.

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ILLUSTRATED PARTS LIST

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INTRODUCTION

TASK 33-51-01-99F-810-A00

1. GENERAL

A. Function of the IPL

(1) The Illustrated Parts List (IPL) gives illustrations and parts breakdown for all parts of the Battery that can be disassembled for maintenance or repair.

(2) The IPL is intended only for use in identifying, provisioning, requisitioning, storing and issuing replaceable parts. To send an order, use only part numbers given in this IPL. Do not use data given on components.

B. How to Use the IPL

(1) If you know the part number:

(a) Find the part number in the Numerical Index and record the figure number and the item number.

(b) Go to the applicable figure.

(c) Find the part on the illustration and in the parts list by the item number.

(2) If you do not know the part number:

(a) Refer to FIG. 1 of the Detailed Parts List.

(b) Find the applicable part.

(c) Refer to the related illustration and item number in the parts list.

TASK 33-51-01-99F-812-A00

2. PLAN OF THE IPL

A. IPL Sub Sections

The IPL has these sub sections:

- IPL Introduction,
- Numerical Index,
- Detailed Parts List.

B. IPL Introduction

The IPL Introduction gives these data:

- Function of the IPL,
- How to use the IPL,
- Explanation of the indentation system,
- Explanation of the DIEHL Aerospace GmbH numbering system,
- List of Vendors.

C. Numerical Index

The Numerical Index (NI) gives all part numbers of the Detailed Parts List sorted by the part number in this sequence:

- Letters A thru Z,
- Numerals 0 thru 9.

D. Detailed Parts List

(1) Use the Detailed Parts List (DPL) to identify the parts of the Battery and their relationship to each other. The DPL gives figures with exploded views to show the parts. Each figure has a list of parts.

(2) The Detailed Parts List has these columns:

- Figure/Item,
- Part Number,
- Airline Stock Number,
- Nomenclature,
- Effectivity (Usage Code),
- Units per Assembly.

(3) FIGURE / ITEM Column

The FIG and ITEM column gives the applicable figure and item number for each assembly or part of the DPL in disassembly order.

(4) PART NUMBER Column

The PART NUMBER column gives the original equipment manufacturer (OEM) part number for each assembly or part in the DPL.

(5) AIRLINE STOCK NUMBER Column

The AIRLINE STOCK NUMBER column is left blank. It is for airline use only.

(6) NOMENCLATURE Column

(a) General

The NOMENCLATURE column gives these data:

- Identifying noun or keyword and description,
- Indenture to show the relationship to other items,
- Vendor code (CAGE code) for supplier parts,
- Parts replacement data,
- Reference to a different figure or to a different CMM for more breakdown.

(b) Indentation System

The indentation system shows the relationship between the parts. For a given item, the number of indentures depicts the relationship of the item to the related next higher assembly as follows:

Assembly
Attaching Parts for Assembly
.Detailed Parts for Assembly
.Subassembly
.Attaching Parts for Subassembly
..Detailed Parts for Subassembly
..Sub-Subassembly
..Attaching Parts for Sub-Subassembly
...Detailed Parts for Sub-Subassembly

(c) Attaching Parts

- Attaching parts are given immediately below the parts grouping or assembly to which they attach and at the same indenture level.
- The separation symbol *** follows the listing of attaching parts.

(d) Vendor Code Identification (VCI)

- Parts made by companies other than DIEHL Aerospace GmbH, Cabin Customisation Interior (D1347), are identified by a vendor code (CAGE Code) that follows the part nomenclature.
- Vendor codes obey the current issues of the Federal Supply Codes for Manufacturers Cataloging Handbooks H4-1 and H4-3. The codes are preceded by the capital letter V, e.g. VD1347.

(e) Parts Replacement Data

Table 10001 gives the terms that show the interchangeability relationship between parts.

TERM	ABBREVIATION	DEFINITION
Optional	OPT	This part is optional to and interchangeable with other parts in the same item number variant group or other item number as designated.
Preferred	PREF	This part is preferred and interchangeable with other parts in the same item number variant group.
Superseded	SUPSD BY	The part in the part number column is replaced by and is not interchangeable with the item number shown in the notation.

PARTS REPLACEMENT DATA
TABLE 10001 (continued on next page)

TERM	ABBREVIATION	DEFINITION
Supersedes	SUPSDS	The part in the part number column replaces and is not interchangeable with the item number shown in the notation.
Replaced by	REPLD BY	The part in the part number column is replaced by and interchangeable with the item number shown in the notation.
Replaces	REPLS	The part in the part number column replaces and is interchangeable with the item number shown in the notation.

PARTS REPLACEMENT DATA
TABLE 10001

(f) Service Bulletin Information

- (PRE SB XXXX) in the NOMENCLATURE column identifies the initial configuration.
- (POST SB XXXX) identifies the assemblies and the parts after the service bulletin modification is completed.

(7) EFFECTIVITY (USAGE CODE) Column

The USAGE CODE column is used for figures with more than one end item. The code (letters A thru Z, without I and O) links the part to the highest assembly on the same figure.

(8) UNITS PER ASSY Column

The UNITS PER ASSY column gives the quantity of a specific item number used on one next higher assembly (NHA) or next higher subassembly.

E. DIEHL Aerospace GmbH Part Numbering System

(1) General

(a) The leading digits of a DIEHL Aerospace GmbH end item part number (vendor code D1347) characterize the family of the unit. Divided by dashes, follows the specified number for the unit, e.g. 3301-31.

(b) Assemblies and items are identified by 10-digit numerical part numbers, e.g. 0001004331.

(c) In CMM revisions before there were 8-digit part numbers (e.g. 01004331) or part numbers with leading "77" and dashes (e.g. 779-413-55). Those part numbers are the same as the new 10-digit part numbers. The part number change implicates the replacement of the leading "77" with "00" and the loss of the dashes. 8-digit part numbers are completed by adding two leading zeros.

(d) Example:

The screw part number 774-026-86 given in CMM revisions before is the same as the new 10-digit part number 0000402686 given in this CMM revision.

(2) OEM Part Numbers

Part numbers given in the PART NUMBER column that are no DIEHL Aerospace GmbH part numbers start with the prefix "HTN" (e.g. HTN0000958530). They refer to the OEM part number and the vendor code that follow the term "ORDER MPN" in the NOMENCLATURE column (e.g. ORDER MPN ISO 7090-5-200 HV-A2/A4 BY VI9008).

3. LIST OF VENDORS

For vendor names and addresses refer to the online Business Identification Cross-reference System (BINCS) search engine on: http://www.dlis.dla.mil/BINCS/begin_search.aspx.

NOTE: The data contained in BINCS is government owned data, and as such may not be used again or marketed for commercial use. Searches are for free, but DLA Logistics Information Services reserves the right to prevent access if unreasonable use of the system is made.

MFR	VENDOR ADDRESS
D1347	DIEHL AEROSPACE GMBH CABIN CUSTOMISATION INTERIOR DONAUSTRASSE 120 D-90451 NUERNBERG, GERMANY
F0225	SOURIAU 9 RUE PORTE DE BUC F-78000 VERSAILLES, FRANCE
F8243	STOCKO CONTACT 7 ROUTE D'EICHHOFFEN F-67140 ANDLAU, FRANCE
I9008	INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO) 1 CHEMIN DE LA VOIE-CREUSE CH-1211 GENEVA 20, SWITZERLAND

LIST OF VENDORS
TABLE 10002

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NUMERICAL INDEX

PART NUMBER	AIRLINE STOCK NUMBER	FIG.	ITEM	TTL REQ
HTN0000958530		1	30	4
HTN0001004342		1	70	1
0000402686		1	20	4
0000941355		1	60	2
0001004330		1	110	1
0001004331		1	10	1
0001004332		1	40	1
0001004333		1	100	1
0001004335		1	50	1
0001004340		1	80	1
0001006935		1	50A	1
0001015307		1	50B	1
0001017495		1	110A	1
0001028681		1	110B	1
0001040957		1	50C	1
3301-31 AMDT B		1	1	RF
3301-31 AMDT C		1	1A	RF
3301-31 AMDT D		1	1B	RF
3301-31 AMDT E		1	1C	RF

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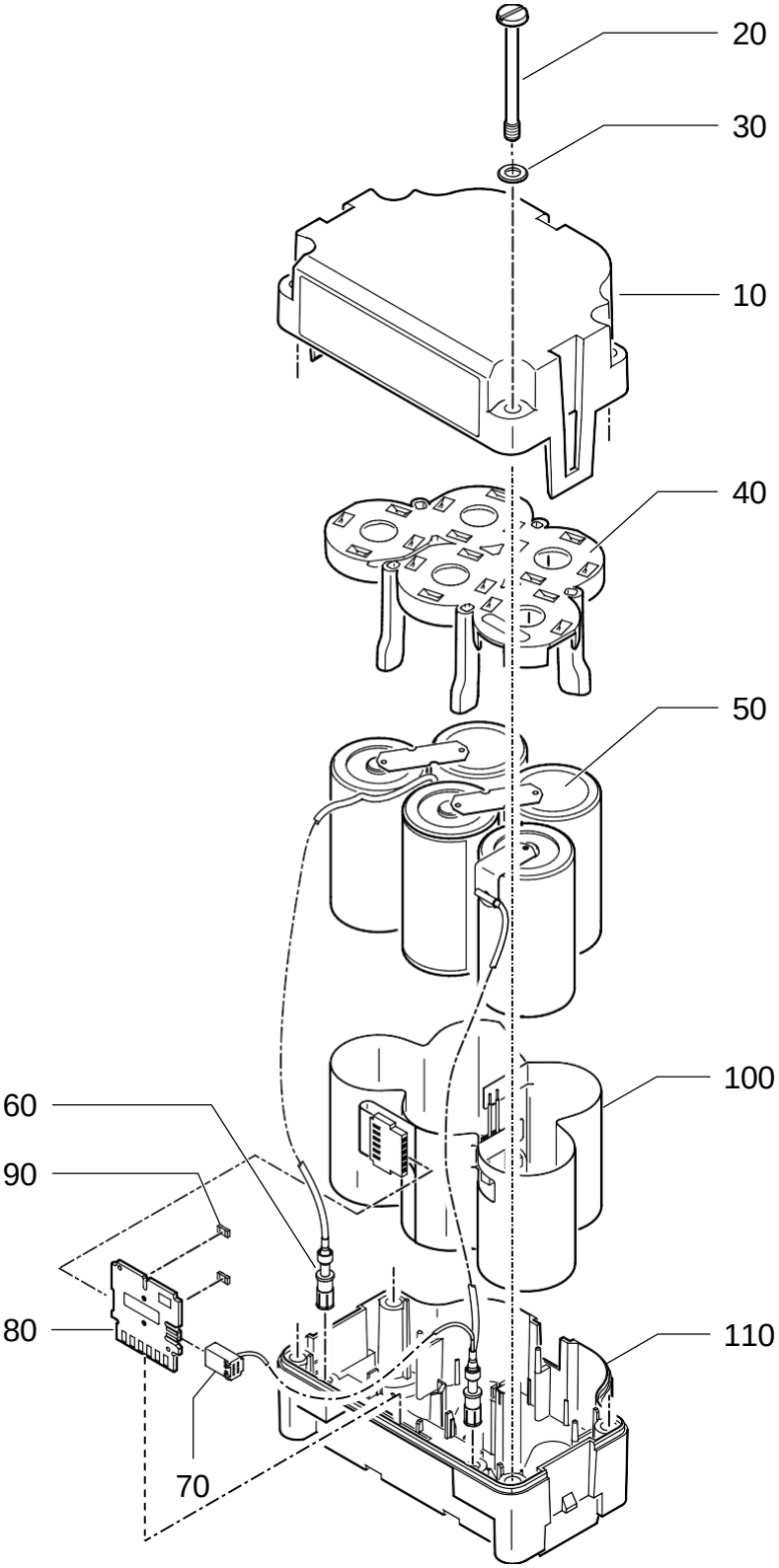
DETAILED PARTS LIST



TEST UNIT - EXPLODED VIEW
FIGURE 1

	FIG. ITEM	PART NUMBER	AIRL. STOCK NO.	NOMENCLATURE 1234567		EFF CODE	UPA
	1						
	- 1	3301-31		BATTERY AMDT B	VD1347	A	RF
	- 1A	3301-31		BATTERY AMDT C PRE SB 3301-33-01	VD1347	B	RF
	- 1B	3301-31		BATTERY AMDT D POST SB 3301-33-01 PRE SB 3301-33-02	VD1347	C	RF
	- 1C	3301-31		BATTERY AMDT E POST SB 3301-33-02	VD1347	D	RF
	10	0001004331		. HOUSING - TOP	VD1347		1
				ATTACHING PARTS			
	20	0000402686		. SCREW - SPECIAL SIZE M5	VD1347		4
	30	HTN0000958530		. WASHER ORDER MPN ISO 7090-5-200 HV-A2/A4 BY VI9008	VI9008		4
				* * *			
	40	0001004332		. PART - CLAMPING	VD1347		1
	50	0001004335		. BLOCK - BATTERY WELDED (NOT PROCURABLE)	VD1347	A	1
R	- 50A	0001006935		. BLOCK - BATTERY WELDED (NOT PROCURABLE)	VD1347	A	1
R	- 50B	0001015307		. BLOCK - BATTERY WELDED (NOT PROCURABLE)	VD1347	BC	1
	- 50C	0001040957		. BLOCK - BATTERY WELDED	VD1347	D	1
	60	0000941355		. . CONTACT	VD1347		2
	70	HTN0001004342		. . CONNECTOR - EDGE, 2-POLE ORDER MPN MKF 13472-6-0-202 BY VF8243	VF8243		1
	80	0001004340		. MODULE - CONNECTOR	VD1347		1
	100	0001004333		. HEATING - FOIL ASSY	VD1347		1
	110	0001004330		. HOUSING - BOTTOM	VD1347	AB	1

FIG. ITEM	PART NUMBER	AIRL. STOCK NO.	NOMENCLATURE 1234567	EFF CODE	UPA
1					
- 110A	0001017495		. HOUSING - BOTTOM VD1347 PREF PN OPT TO ITEM 110	B	1
- 110B	0001028681		. HOUSING - BOTTOM VD1347	CD	1