Maintenance Manual

MM-011932-001

Rev. D, March 2017

Single-Bay Battery Charger

(CH-104560-007, -016, -017, & -026)

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REV	DATE	REASON FOR CHANGE
-	May/08	Initial Release.
A	Jan/10	Update the compatibility table and drawings as necessary. Update format to reflect that of Harris corporate identity. Add 3 position DIP switch information.
B	May/12	Updated manual and moved 6-Bay charger maintenance instructions to Maintenance Manual 14221-1100-5020.
C	Aug/15	Changes to Table 2-2.
D	Mar/17	Removed CE mark and updated Section 1.3.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

INDUSTRY CANADA

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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Repairs to this equipment should be made only by an authorized service technician or facility designated by the supplier. Any repairs, alterations, or substitution of recommended parts made by the user to this equipment not approved by the manufacturer could void the user's authority to operate the equipment in addition to the manufacturer's warranty.

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1. REGULATORY AND SAFETY INFORMATION

1.1 SAFETY CONVENTIONS

The following conventions are used throughout this manual to alert the user to general safety precautions that must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. L3Harris assumes no liability for the customer's failure to comply with these standards.

WARNING - The electrical hazard symbol indicates there is an electrical hazard present.

The WARNING symbol calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a WARNING symbol until the conditions identified are fully understood or met.

The **CAUTION** symbol calls attention to an operating procedure, practice, or the like, which, if not performed correctly or adhered to, could result in a risk of danger, damage to the equipment, or severely degrade the equipment performance.

The **NOTE** symbol calls attention to supplemental information, which may improve system performance or clarify a process or procedure.

The **ESD** symbol calls attention to procedures, practices, or the like, which could expose equipment to the effects of **E**lectro-**S**tatic **D**ischarge. Proper precautions must be taken to prevent ESD when handling circuit modules.

1.2 FCC COMPLIANCE

The CH-104560-xxx Single-Bay Charger has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate Radio Frequency (RF) energy and, if not installed and used in accordance with these instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications to this equipment not expressly approved in this manual could void your warranty and your authority to operate this equipment.

Rechargeable batteries have a useful lifetime. After this, they must be disposed of (see Section 1.1). Always follow approved processes when disposing of old or bad batteries.

1.3 SAFETY STANDARDS

1. CSA C22.2 No 60950-1-03.

   With national differences for Argentina, Australia, Brazil, Canada, China, New Zealand, Singapore, and the United States of America.

2. CISPR 22 / EN55022 / ICES-003 / FCC part 15 / ACMA

   With national differences for Brazil, Argentina, and New Zealand/Australia.

   a. This device may not cause harmful interference.

   b. This device must accept any interference received, including interference that may cause undesired operation.

INDUSTRY CANADA

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

3. CISPR 24 / EN55024

   With national differences for Brazil, Argentina, and New Zealand/Australia.

1.4 IMPORTANT SAFETY INSTRUCTIONS

1. READ AND FOLLOW SAFETY INSTRUCTIONS. - Before using the charger, read all instructions and cautionary markings on (1) the battery charger, (2) the battery, and (3) the product using the battery.
2. ***SAVE THIS MANUAL***—It contains important safety and operating instructions for the charger.
3. The CH-104560-xxx Single-Bay Charger is designed for indoor use only.
4. Do not use auxiliary equipment not recommended or sold by the manufacturer. To do so may result in a risk of fire, electric shock, or injury to persons.
5. Make sure the power cord is located so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress.
6. Take care when placing the charger in service to ensure proper top and bottom ventilation. A minimum of 1/4" is required between the bottom of the charger and the surface on which it sits.

***DANGER*: Risk of Electric Shock. Do not expose charger to rain or snow. Do not use in a bathroom.**

***DANGER*: Risk of Electric Shock or Fire. There are no user-serviceable parts in the charger. Do not disassemble the charger. Return it to a qualified service shop when service or repair is required. Incorrect reassembly may result in a risk of electrical shock or fire.**

***DANGER*: To reduce risk of electric shock, unplug the charger from the outlet before attempting any cleaning.**

***DANGER*: Never alter the AC cord or plug. If it will not fit in the outlet, have a proper outlet installed by a qualified electrician. Improper connection can result in risk of an electric shock.**

***WARNING*: To reduce the risk of fire, explosion, or injury, charge only L3Harris battery packs that are accepted by the battery sleeve and authorized by the manufacturer. Charging any other battery pack or batteries may cause the battery to burst and cause personal injury or damage.**

There are no user-serviceable parts in the charger. Do not disassemble the charger. Return it to a qualified service shop when service or repair is required. Incorrect reassembly may result in the risk of electrical shock or fire.

ATTENTION Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Due to the temperature characteristics of Nickel-Cadmium, Nickel Metal Hydride, Lithium Ion, and Lithium Polymer batteries, the batteries will not accept a full charge at temperature extremes. For maximum capacity, recharge the battery pack at a room temperature of 18ºC to 30°C (65ºF to 85°F), whenever possible.

2. INTRODUCTION

This manual provides maintenance instructions for the CH-104560-xxx Single-Bay Battery Chargers. The CH-104560-xxx charger is available in four different models. These are listed in Table 2-1. Refer to Table 2-2 for battery/charger compatibility.

Table 2-1: Charger Models

PRODUCT NUMBER	DESCRIPTION	RADIOS SUPPORTED
CH-104560-007	Charger, Single, Tri-Chemistry (NiCd, NiMH, Li-ion, Li-Poly)	P5300, P5400, P5500, P7300, and XG-75 series radios
CH-104560-016	Charger, Single, Extended Capacity (Li ion only)	P5100, P5200, P7100, and P7200 series radios
CH-104560-017	Charger, Single, Tri-Chemistry (NiMH, Li-ion, Li-Poly)	XG-25P series radios
CH-104560-026	Charger, Single, NiCd and NiMH	P5100, P5200, P7100, and P7200 series radios

Table 2-2: Charger and Battery Configuration

BATTERY PART NUMBER	BATTERY DESCRIPTION	CH-104560-			
		007	016	017	026
BKB191210/33	7.5V, NiCd, 1600 mAh, Immersible				X
BKB191210/34	7.5V, NiMH, 2400 mAh, Immersible				X
BKB191210/35	7.5V, NiCd, 1600 mAh, FM/CSA <FM>, Immersible				X
BKB191210/36	7.5V, NiMH, 2400 mAh, FM/CSA <FM>, Immersible				X
BKB191210/43	7.5V, NiCd, 1600 mAh, Driven Rain				X
BKB191210/44	7.5V, NiMH, 2400 mAh, Driven Rain				X
BT-010942-001	7.5 V, Li-ion,3200 mAh, Immersible		X		
BT-010942-002	7.5 V, Li-ion, 3200 mAh, FM <FM>, SMART		X		
BT-023406-001	7.5 V, NiCd, 1600 mAh	X			
BT-023406-002	7.5 V, NiCd, 1600 mAh, FM <FM>	X			
BT-023406-003	7.5 V, NiMH, 2400 mAh	X		X	
BT-023406-004	7.5 V, NiMH, 2400 mAh, FM <FM>	X		X	
BT-023406-005	7.5 V, Li-ion, 2000 mAh	X		X	
BT-023436-001	7.4V, Li-Poly, 3600 mAh, Immersible	X		X	

3. SPECIFICATIONS

Table 3-1: Single-Bay Charger (CH-104560-xxx) Specifications

PARAMETER	LIMITS
Voltage Source:	
North America	120 Vac ±10%, 50/60 Hz
Overseas (with appropriate power cord)	100-240 Vac, 50/60 Hz
Power Consumption:	19 Watts
Charge Current:	1.5 A ±10% or 1.0 A ±10% (switch selectable)
Charging Voltage Range	
Ni Chemistry	6.0V – 11.2V ±5%
Li Chemistry	6.0 – 8.35V ±0.05V
Trickle Charging Current :	
(NiCd and NiMH)	180 mA ±50 mA or 90 mA ±50 mA (switch selectable)
Discharge Current:	1.0A minimum @ 8.6V pack voltage
Operating Temperature Range:	+32°F to +113°F (0°C to +45°C)
Charging temperature range: *(Start Rapid or Discharge Functions)*	
Ni Chemistry	+41°F to +113°F ±37.4°F (+5.0°C to +45°C ±3°C)
Li Chemistry	+41°F to +104°F ±37.4°F (+5.0°C to +40°C ±3°C)
Charging temperature range: *(During Rapid Charge)*	
Ni Chemistry	+32°F to +122°F ±37.4°F (0°C to +50°C ±3°C)
Li Chemistry	+32°F to +113°F ±37.4°F (0°C to +45°C ±3°C)
Dimensions (H x W x D):	
Height	4.4 inches (112 mm)
Width	
Front	4.7 inches (118.5 mm)
Rear	5.3 inches (134.6 mm)
Depth	6.6 inches (168 mm)
Weight:	
Charger and Sleeve	1.1 lb. (500 g)
Charger as shipped	1.85 lb. (839 g)
Battery Type:	Nickel Cadmium (NiCd) Nickel Metal Hydride (NiMH) Lithium Ion (Li-ion) Lithium Polymer (Li-Poly)
Recharge Time:	
NiCd	Approximately 1 Hour
NiMH	Approximately 2 Hours
Li-ion	Approximately 4 Hours
Li-Poly	Approximately 4 Hours

4. DESCRIPTION

4.1 GENERAL

The Single-Bay Charger is designed to charge L3Harris Nickel Cadmium (NiCd), Nickel Metal Hydride (NiMH), Lithium Ion (Li-ion), and Lithium Polymer (Li-Poly) batteries used with L3Harris portable radios. The Single-Bay Charger is typically situated on a desk or table top. The charger can charge the battery pack with or without being attached to the radio. However, the charger is not designed to charge a transmitting radio. Turn **off** all radios before placing them into the charger.

4.1.1 Charger Sleeves

Each charger sleeve is specifically created for a particular radio or series of radios. The sleeve plugs into the charger base, using guides in the base for self-alignment. This allows easy insertion of either a battery pack alone or a radio with its battery pack attached. Each sleeve has spring-loaded electrical contacts to mate with the charging and thermistor contacts on the battery pack.

4.1.2 Easy-to-Use Indicators

Microprocessors monitor the charge rate to compensate for hot or cold batteries, weak or defective batteries, and line voltage variations. Multi-color LEDs on the charger front panel provide useful charging status information and indicate when full charge is achieved.

4.2 TRI-CHEMISTRY CHARGER, CH-104560-007 AND -017

The CH-104560-007 Single-Bay Tri-Chemistry Chargers are designed to charge L3Harris BT-023436-001 Lithium Polymer battery pack and the BT-023406 series Nickel Cadmium (NiCd), Nickel Metal Hydride (NiMH), and Lithium Ion (Li-ion) Battery packs. The CH-104560-017 Single-Bay Tri-Chemistry Chargers are designed to charge L3Harris BT-023436-001 Lithium Polymer battery pack and the BT-023406 Nickel Metal Hydride (NiMH), and Lithium Ion (Li-Ion) Battery packs.

The -007 charger supports the P5400, P5500, P7300, and XG-75 series radios and the -017 charger supports the XG-25P series radios. The chargers are capable of charging most battery packs in approximately one (1) to four (4) hours.

4.2.1 Intelligent Charging

The Tri-Chemistry Charger communicates directly with the battery. The battery allows tracking and storage of portable radio, battery, and charger system parameters, including:

- Battery identification by charger.
- Tracking of charge cycles.

The Tri-Chemistry Single-Bay Battery Charger also provides the following features when used with BT-023406 series NiCd and NiMH batteries. These are detailed in Section 4.5.

- Automatic initial conditioning of batteries.
- “Discharge before Charge” features.[1]

[1] The “Discharge before Charge” feature requires a service shop level adjustment via “Dip Switch” settings. Refer to Section 6.3.

4.3 Li-ion CHARGER, CH-104560-016

The CH-104560-016 Single-Bay Battery Charger is designed to charge only L3Harris P5100, P5200, P7100^{IP}, and P7200 series radios portable radios with Li-ion battery packs. It is capable of charging battery packs in approximately four (4) hours.

The CH-104560-016 is also capable of "Intelligent Charging" as described in Section 4.2.1.

4.4 NiCd AND NiMH CHARGER, CH-104560-026

The CH-104560-026 Single-Bay Battery Charger is designed to charge L3Harris NiCd and NiMH portable radio battery packs. It can accommodate batteries used with the P5100, P5200, P7100^{IP}, and P7200 series radios and is capable of charging most battery packs in approximately one (1) to two (2) hours.

The CH-104560-026 is includes the "Advanced capabilities" as described in Section 4.5.

4.5 ADVANCED AUTOMATIC CONDITIONING CAPABILITIES

The charger includes the following advanced features:

- Automatic initial conditioning of NiCd and pre-conditioning of NiMH batteries.
- "Discharge before Charge" feature automatically "empties" the battery pack before starting the charge cycle. This feature helps to reduce the impact of shallow discharge profiles or memory effect. This feature requires service shop level adjustment via "Dip Switch" settings.

If the pack is within battery voltage and temperature limits, the charger starts the safety timer and begins a charge cycle. The safety timer's limits are set according to the battery pack chemistry.

The charger initiates an automatic conditioning routine for the BT-023406 series NiCd or NiMH batteries. The charger reads the condition counter register in the pack memory. If the condition counter register's value is less than three (3), the charger automatically enters a conditioning routine in which the battery pack is charged, and then discharged. This routine is repeated for three (3) cycles, followed by a full charge cycle, leaving the battery fully charged for normal use. All of the above will occur without user intervention. We recommend allowing the battery pack to charge overnight to complete this routine.

The "Discharge before Charge" feature automatically "discharges" the battery pack before starting the charge cycle. This feature helps to reduce the impact of shallow discharge profiles or memory effect.

If the battery voltage is below acceptable limits, the charger starts the safety timer and goes into the pre-charge mode. If the battery is over or under temperature, the charger suspends charging and waits until the temperature is within the acceptable temperature window. If the battery stays outside the temperature limits or below the voltage limit and the safety timer times out, the charger will go into fault mode.

When the green LED flashes (after rapid charge), the charger is in top-off mode for the Nickel chemistries (approximately 92% full). After approximately two (2) hours, the green LED becomes solid and charge is complete.

5. OPERATION

5.1 CHARGING BATTERY PACKS

L3Harris chargers are specifically designed for charging L3Harris approved battery packs. The chargers differentiate between NiCd, NiMH, Li-ion, and Li-Poly battery packs and automatically adjust charging rates.

Charging Guidelines:

Observe the following guidelines when charging a battery pack:

- Avoid high temperatures during charging.
- Discontinue use if the charger is overheating.
- Do not leave batteries in the charger indefinitely. For best results leave the battery in the charger for two to six hours after the Green Ready LED comes on. Then place the battery pack into service and fully discharge (as indicated by the radio "Low Batt" warning) before re-charging.

If any faults are encountered while charging the battery pack, refer to the troubleshooting information in Section 7.

5.2 USING THE CHARGER

Locate the charger on a desk or other flat surface near a 120/230 Vac, 50/60 Hz power source. Plug the power cord into the outlet. Be sure to provide adequate ventilation; a minimum of ¼ inch clearance is necessary.

1. **Turn the radio OFF** or remove battery from radio.

Recharging any battery pack, or batteries other than those the equipment was designed to charge, may result in damage to equipment, leakage, fire, or explosion.

Charge only L3Harris battery packs that are accepted by the battery sleeve and authorized by the manufacturer. Charging any other battery pack or batteries may cause the battery to burst and cause personal injury or damage.

This charger is not intended to be used with a transmitting portable radio. Doing so may violate regulatory compliance.

DO NOT remove, install, or charge batteries in potentially explosive atmosphere areas.

Sparks in such areas could cause an explosion or fire resulting in bodily injury or even death.

NOTE

The battery can be charged with or without the radio.

Figure 5-1: CH-104560-xxx Charger

2. Slide the battery or radio into the charger using the battery alignment guides. Insert the radio with the speaker facing the front of the charger.
3. Observe the LED indications (see Table 5-1).

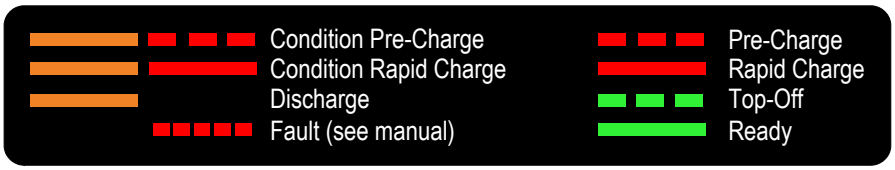


Figure 5-2: Charger Label Legend

The solid red LED will light on the charger, indicating the battery is in Charge mode. If the red LED flashes slowly, the charger is in Pre-Charge mode. This should switch to Charge mode within 10-15 minutes.

After rapid charge, the charger will go into top-off mode (when the green LED flashes) for approximately two hours.

NOTE

Fault conditions that occur during the charging process and result in termination of charge are listed Table 7-1. These faults are indicated by a fast blinking red LED. Clearing the fault indication requires removing the battery or cycling charger power, depending on the type of the fault detected.

Table 5-1: Standard Operating LED Indications

MODE	Li-ion and Li-Poly	NiMH and NiCd
No battery installed	All LEDs off	All LEDs off
Charge	Red on/Green off	Red on/Green off
80% charge point (Li-ion, Li-Poly) or 90% (Nickel-based)	Red off/Green flashes slow	Red off/Green flashes slow
100% charge complete	Red off/Green solid	Red off/Green solid
Condition Mode Charging 3X		Orange LED on Red on
Condition Mode Discharging 3X		Orange LED on Red off
Condition final charge cycle		Red on/Green off (back to normal)

4. When the green LED light is solid, charging is complete, and the charger is in Trickle Charge mode.
5. Remove battery or radio from the charger.


NOTE

If charging a new battery or a battery which has been out of use for a few months, the charger will prematurely switch to Trickle Charge mode before the battery is fully charged. In this event, allow the battery to continue Trickle Charging overnight. Remove and re-insert the battery, and be sure that the battery goes through a normal rapid charge before use.

5.3 BATTERY FAULT CONDITIONS

A flashing red indicator may indicate that the Single-Bay Battery Charger has detected a battery fault condition. Refer to Table 7-1 for additional information.

6. SERVICE

6.1 CHARGER CARE

- Unplug the charger from the power source before cleaning.
- Use compressed air to clean out air ducts and radio sleeve.
- Clean the housing with a soft cloth or tissue dampened with water (or a mild detergent-water solution).
- If a detergent solution is used, rinse with a clean tissue dampened with water only.

Do not allow liquids to enter the charger. Failure to observe this warning may result in the risk of electrical shock or damage to equipment.

- If the sleeve contacts become oxidized, clean them using a soft cloth and mild contact cleaner.

6.2 BATTERY CARE AND DISPOSAL

The L3Harris portable radios use rechargeable, recyclable Nickel Cadmium (NiCd), Nickel Metal Hydride (NiMH), Lithium Ion (Li-ion), or Lithium Polymer (Li-Poly) battery packs. Their best performance and useful life can be assured through proper care of the battery. Refer to ECR-7367 for detailed maintenance instructions and L3Harris recommendations for establishing a formal battery maintenance program.

Do not disassemble or modify Lithium Ion or Lithium Polymer battery packs. The Li-ion and Li-Poly battery packs are equipped with built-in safety and protection features. Should these features be disabled or tampered with in any way, the battery pack can leak acid, overheat, emit smoke, burst, and/or, ignite.

If the battery pack is ruptured or is leaking electrolyte that results in skin or eye contact with the electrolyte, immediately flush the affected area with water. If the battery electrolyte gets in the eyes, flush with water for 15 minutes and consult a physician immediately.

6.2.1 Battery Pack Usage

NiCd and NiMH batteries vary in capacity and life cycle. NiCd batteries have a longer life cycle than NiMH batteries whereas NiMH batteries have a larger capacity. Both types of batteries require basic usage guidelines be followed in order to increase the battery runtime or shift life.

The following guidelines will help increase the battery runtime or shift life:

- Ensure the battery pack is fully discharged (as indicated by the radio "Low Batt" warning) before re-charging.
- Periodically service battery packs (refer to Section 6.2.2). If the battery is fully discharged (to radio Low Battery warning) during routine use, the frequency of conditioning may be extended.

NOTE

Do not leave NiCd or NiMH batteries in a charger for more than a few days.

6.2.2 Servicing Battery Packs

To ensure battery packs are readily available for radio operators (that is, the user has a fully charged, long running battery pack at the beginning of the work-shift), we recommend establishing a battery service program (refer to ECR-7367 for details). As part of that program, it is important to actively monitor battery usage and periodically recondition the battery pack (refer to Table 6-1 and Section 6.2.3).

Table 6-1: Battery Pack Usage Patterns

PATTERN	DESCRIPTION	EXAMPLE	NEED TO RECONDITION
A	Battery is taken out of the charger and used for 8-12 hours (low battery warning) then recharged.	A police officer that carries the radio all day.	Annually, to track capacity
B	Battery is charged, used for over 8 hours then recharged and immediately used for the next shift.	A manufacturing plant that has three shifts a day.	Semiannually
C*	Battery is fully charged, used for 4 hours or less, and returned to the charger.	An administrator. May apply to a user that has two batteries.	Monthly
D*	Battery and radio reside in the desktop charger, radio turned ON waiting for a call.	Fireman or EMS	Monthly
E	Battery and radio are used with a vehicular charger.	Vehicle patrol officer.	Monthly
F	Batteries are stored for more than two weeks at room temperature		After one month of storage
G	Batteries are stored for more than two weeks at elevated temperatures (around 30°C)		After two weeks storage
(* These patterns are the hardest on a battery pack)			

6.2.3 Reconditioning Battery Packs

Always use L3Harris authorized chargers and conditioners. Use of unauthorized chargers and conditioners may void the warranty.

6.2.3.1 Conditioning NiMH Battery Packs

Failure to properly condition NiMH battery packs before initial use will result in shortened performance by the battery.

Condition a new NiMH battery pack before putting it into use. This also applies to rechargeable NiMH battery packs that have been stored for long periods (weeks, months, or longer). Conditioning requires fully charging and fully discharging the battery pack three (3) times. The first time the battery pack is put into the charger, it will condition Nickel-based battery packs by automatically charging and discharging (cycling) the battery.

6.2.3.2 Conditioning NiCd Battery Packs

A new NiCd battery pack does not require conditioning before use. However, we recommend periodically conditioning NiCd battery packs to avoid a condition known as “memory effect.” Memory effect results when a NiCd battery pack is repeatedly charged and not fully discharged, resulting in a lower output voltage and a lower capacity. Fortunately, both nominal voltage and capacity is restored through battery conditioning.

Conditioning requires fully charging and fully discharging the battery pack three (3) times using the tri-chemistry charger. The first time the battery pack is put into the charger, this unit will condition Nickel-based battery packs by automatically charging and discharging (cycling) the battery.

6.2.3.3 Conditioning Li-ion and Li-Poly Battery Packs

Lithium Ion and Lithium Polymer battery packs do not suffer from memory effect and therefore do not require conditioning.

6.2.4 Battery Pack Storage Guidelines

If a battery pack is expected to be idle for a month or more, it should be properly prepared.

Battery packs should not be stored fully charged. Before storing Nickel-based battery packs, discharge them to their end-of-life voltage (about six volts). If the battery is not discharged prior to storage, depending on the length of storage, its overall capacity may be reduced.

Lithium Ion and Lithium Polymer batteries should be stored with approximately 40% charge. Although, all battery packs experience some capacity loss during storage, the shelf life varies by chemistry, for example, the shelf life for NiMH battery packs is about three years and for NiCd battery packs about five years. It should be noted that any capacity drop that occurs during storage is permanent and cannot be reversed.

While capacity loss cannot be totally prevented, the following guidelines will reduce the effect during storage:

- Battery packs should be stored in a cool dry storage area (32 to 86°F [0 to 30°C]), preferably a refrigerator, but avoid storing in freezers. Place the battery pack in a plastic bag to protect it against condensation.
- Do not store charged battery packs, ensure the battery has been discharged (to about 6 volts).
- Li-ion and Li-Poly batteries should be stored approximately 40% charged.
- Never leave a nickel-based battery sitting on a charger for more than a few days.
- Recondition the battery pack before returning it to service.

6.2.5 Battery Pack Disposal Guidelines

Never incinerate a battery. Disposing of a battery pack by burning will cause an explosion.

6.2.5.1 Nickel Cadmium Battery

RECHARGEABLE BATTERY PACK DISPOSAL – At the end of its useful life, under various state and local laws, it may be illegal to dispose of a battery pack into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal. Canadian and U.S. users may call Toll Free 1-800-8-BATTERY® for information and/or procedures for returning rechargeable batteries in your locality.

6.2.5.2 Nickel Metal Hydride Battery

There are no special requirements concerning the disposal of NiMH batteries. NiMH batteries can be recycled. Call Toll Free 1-800-8BATTERY for information.

6.2.5.3 Lithium Ion and Lithium Polymer Batteries

There are no special requirements concerning the disposal of Li-ion and Li-Poly batteries. Li-ion batteries can be recycled. Call Toll Free 1-800-8BATTERY for information.

6.3 DIP SWITCH CONFIGURATION/CONTROL

L3Harris Technologies' Single-Bay Chargers, CH-104560-xxx, are microprocessor controlled and use a switching power supply to regulate the charge current and voltage. The charge control microprocessor in the charger reads the pack identification information from the battery memory chip contained in the batteries, and establishes the appropriate charge profile for Lithium Ion, Lithium Polymer, Nickel Metal Hydride, or Nickel Cadmium packs.

The microprocessor is programmed during manufacturing and is not intended for general revision. However, provision is provided for service depot level re-programming should it be necessary. The DIP switches are NOT end-user selectable and must be switched at a depot level service shop.

The charger will check the positions of the three circuit DIP switches when AC power is applied. The charger uses the reading obtained for all subsequent operations until it is reset by cycling the AC power. From these DIP switch positions, the charger adjusts the charger algorithm per Table 6-2.

Table 6-2: Charge Parameter Adjustment DIP Switch Positions (SW1)

SW	DESCRIPTION	LI-ION AND LI-POLY ON	LI-ION AND LI-POLY OFF	NICD AND NIMH ON	NICD AND NIMH OFF
1	Rapid Charge Rate	High	Low	High	Low
2	Trickle Charge Rate	High	Low	Low	High
3	Discharge Before Charge	N/A	N/A	Normal	Discharge First

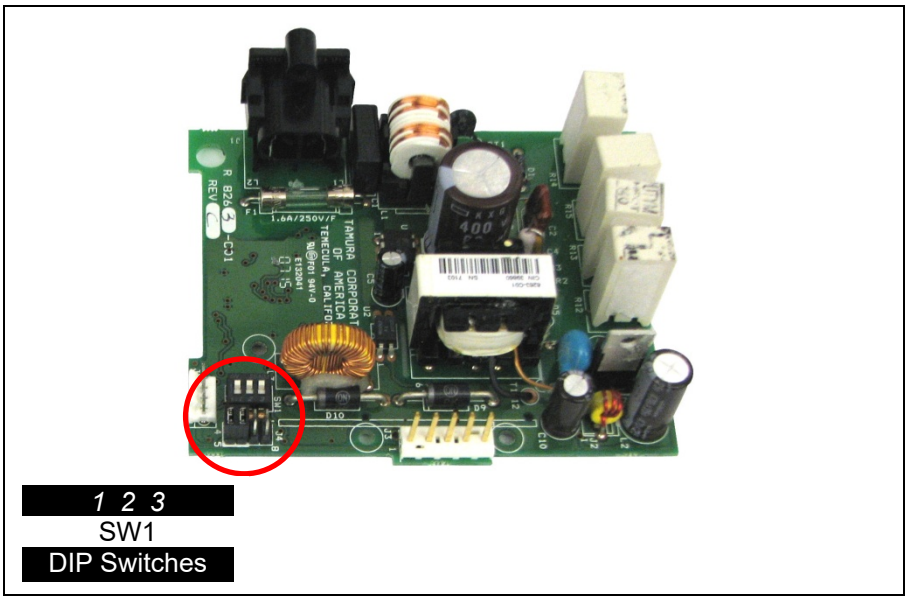


Figure 6-1: Main Board Assembly, SW1 DIP Switch

7. TROUBLESHOOTING

The Single-Bay Battery Charger has the capability to detect the battery fault conditions listed in Table 7-1.

7.1 DEFINITIONS

Hot Battery: Battery pack excessively warm due to charging or environmental temperature conditions.

Cold Battery: Battery pack excessively cool due to environmental conditions.

Weak Battery: Battery pack with low voltage due to long-term self-discharge or extreme discharge.

Defective Battery: Battery pack with one or more of the internal cells open or shorted, or a pack that has exceeded its useful life.

Table 7-1: Error Condition Indicators

INDICATION	CONDITION	VALUE	CHARGER ACTION
Slow Flash RED LED	Hot Ni battery (before rapid charge).	Battery temperature ≥ upper temperature limit ± 3°C.	Thermal standby, wait to cool below upper temperature limit.
Fast Flash RED LED	Hot Ni/+-Li-ion battery (during rapid charge).	Battery temperature ≥ upper temperature limit ± 3°C and Ni battery voltage < 8.16V. Li-ion goes to fault mode if ≥ upper temperature limit.	Fault mode, charge off.
Slow Flash RED LED	Cold battery (before rapid charge).	Battery temperature ≤ lower temperature limit ± 3°C.	Thermal standby, wait to warm above lower temperature limit.
Slow Flash RED LED	Cold battery (during rapid charge).	Battery temperature ≤ lower temperature limit ± 3°C.	Thermal standby, wait to warm above lower temperature limit.
Slow Flash RED LED	Precharge Voltage Low battery voltage.	Battery voltage < lower battery voltage limit ± 5%.	Begin Pre-charge, charge battery at Top-Off Current ± 10%.
Fast Flash RED LED	Precharge time out elapsed.	Precharge time > Precharge Timeout ± 10% (in minutes).	Fault mode charge off. Note: Precharge current is defined above. Time out assumes a shorted cell.
GREEN LED	Rapid charge safety timer elapsed.	Determined by value of register in battery memory.	Charge complete.
Fast Flash RED LED	Unable to determine battery type.	Cannot read memory module.	Fault mode, charge off.

Fast Flash = 0.1 Sec ON – 0.1 Sec OFF (4.5 Hz)
Slow Flash = 0.9 Sec ON – 0.9 Sec OFF (0.6 Hz)
Note: Due to timer resolution, the flash rate will be centered on these values.

Table 7-2: Troubleshooting

SYMPTOM	FAULT
No LED activity.	Power cable not plugged in securely. Battery pack not properly inserted. Charging contacts on battery or charger dirty. Disconnect power cord. Contacts can be cleaned using a soft cloth impregnated with a mild contact cleaner. Defective charger. Return to qualified service shop for repair.
Slow/Fast Red Flash for more than 10 minutes.	Indicates a fault condition preventing the battery from accepting a rapid charge. Battery is too cold (below 0°C/32°F). Battery is too hot (above 45°C/113°F). Battery is weak/excessively discharged. Battery is defective. See Table 7-1. May also indicate high resistance at the battery or sleeve contacts. Repeat using a known good battery, and if problem repeats, check the following are clean and in good condition: Battery pack contacts Charger spring contacts (Disconnect power cord. Contacts can be cleaned using a soft cloth with a mild contact cleaner.)

7.2 BATTERY CONTACT LAYOUT

The battery pack contacts shown in the following examples are looking at the back of a battery pack. When looking at the contacts on the chargers, the contacts will be in reverse order. Refer to Figure 7-1 and Figure 7-2.


NOTE

The battery pack contacts shown in the following examples are viewed from the back of a battery pack. When viewing the charger contacts, the contacts will be in reverse order.

The A+ contact on the BT-series batteries provides battery charger A+ to all four battery types (NiCd, NiMH, Li-ion, and Li-Poly). The DATA charger contact is only used for BT series battery packs.

BKB Series and BT-191210 Series Battery Packs are for NiCd and NiMH Only. These battery packs have separate contacts for NiCd and NiMH A+ connections.

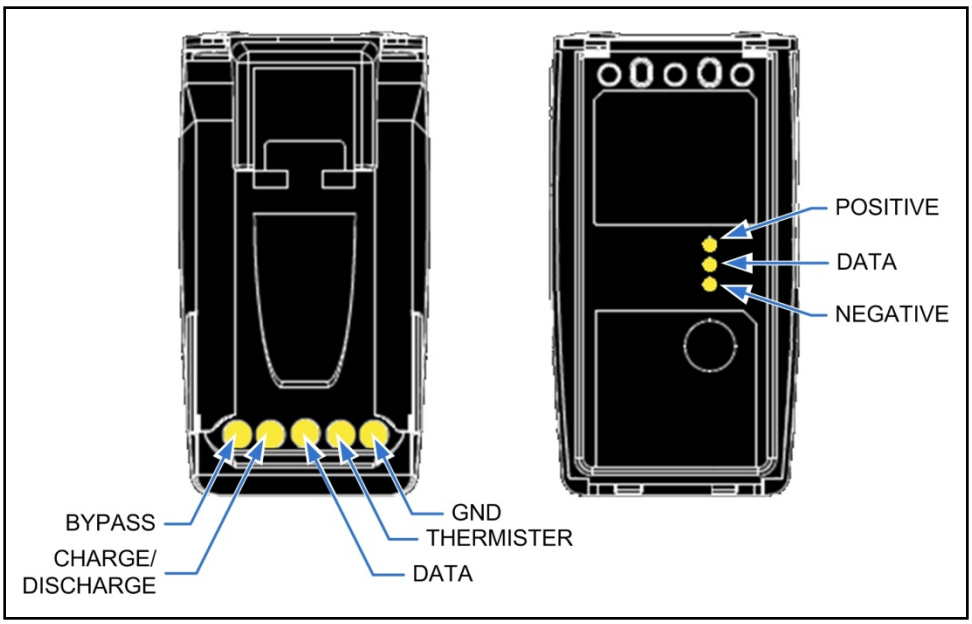


Figure 7-1: BT-023406 and BT-023436 Series Battery Packs

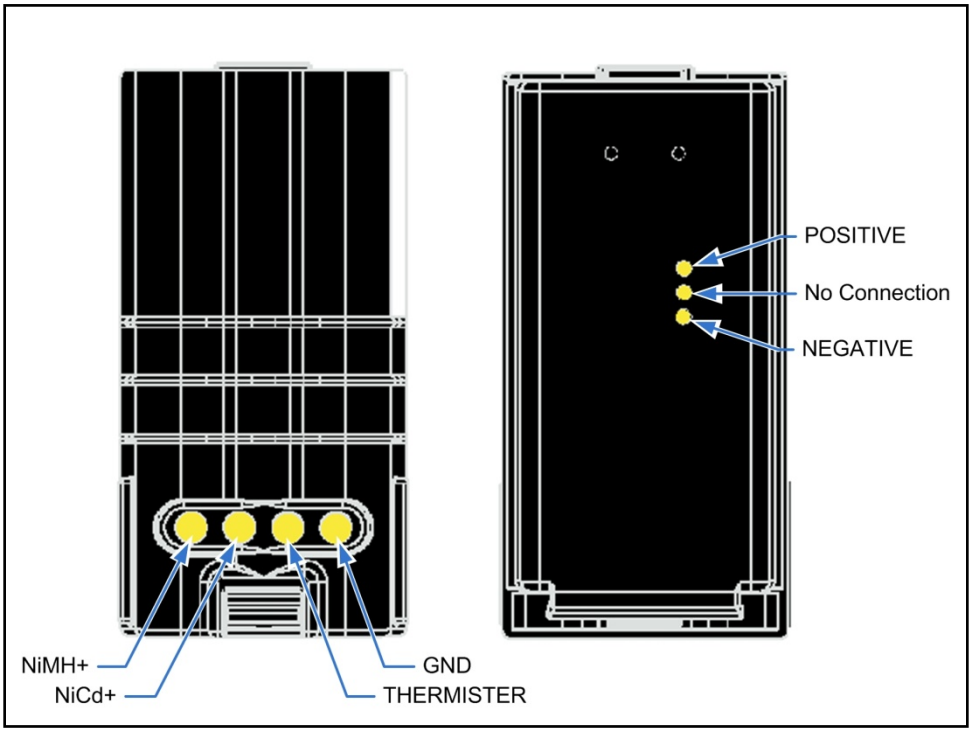


Figure 7-2: BKB191210 Series Battery Pack

8. CUSTOMER SERVICE

8.1 TECHNICAL ASSISTANCE

L3Harris' Technical Assistance Center (TAC) resources are available to help you with overall system operation, maintenance, upgrades, and product support. TAC is your point of contact when you need answers to technical questions.

Product specialists, with detailed knowledge of product operation, maintenance, and repair provide technical support via a toll-free telephone number (in North America). Support is also available through mail, fax, and e-mail.

For more information about technical assistance services, contact your sales representative, or contact the Technical Assistance Center directly at:

North America:	1-800-528-7711
International:	1-434-385-2400
Fax:	1-434-455-6712
E-mail:	PSPC_tac@l3harris.com

8.2 CUSTOMER CARE

If any part of the system equipment is damaged on arrival, contact the shipper to conduct an inspection and prepare a damage report. Save the shipping container and all packing materials until the inspection and the damage report are completed. In addition, contact the Customer Care center to make arrangements for replacement equipment. Do not return any part of the shipment until you receive detailed instructions from an L3Harris representative.

Contact the Customer Care center at https://www.l3harris.com/all-capabilities/pspc-customer-care or:

North America:

Phone Number:	1-800-368-3277
Fax Number:	1-321-409-4393
E-mail:	PSPC_CustomerFocus@l3harris.com

International:

Phone Number:	1-434-455-6403
Fax Number:	1-321-409-4394
E-mail:	PSPC_InternationalCustomerFocus@l3harris.com

9. CHARGER ASSEMBLY

All components in the following parts lists are for reference only and are considered common parts available from your local electronic parts distributor.

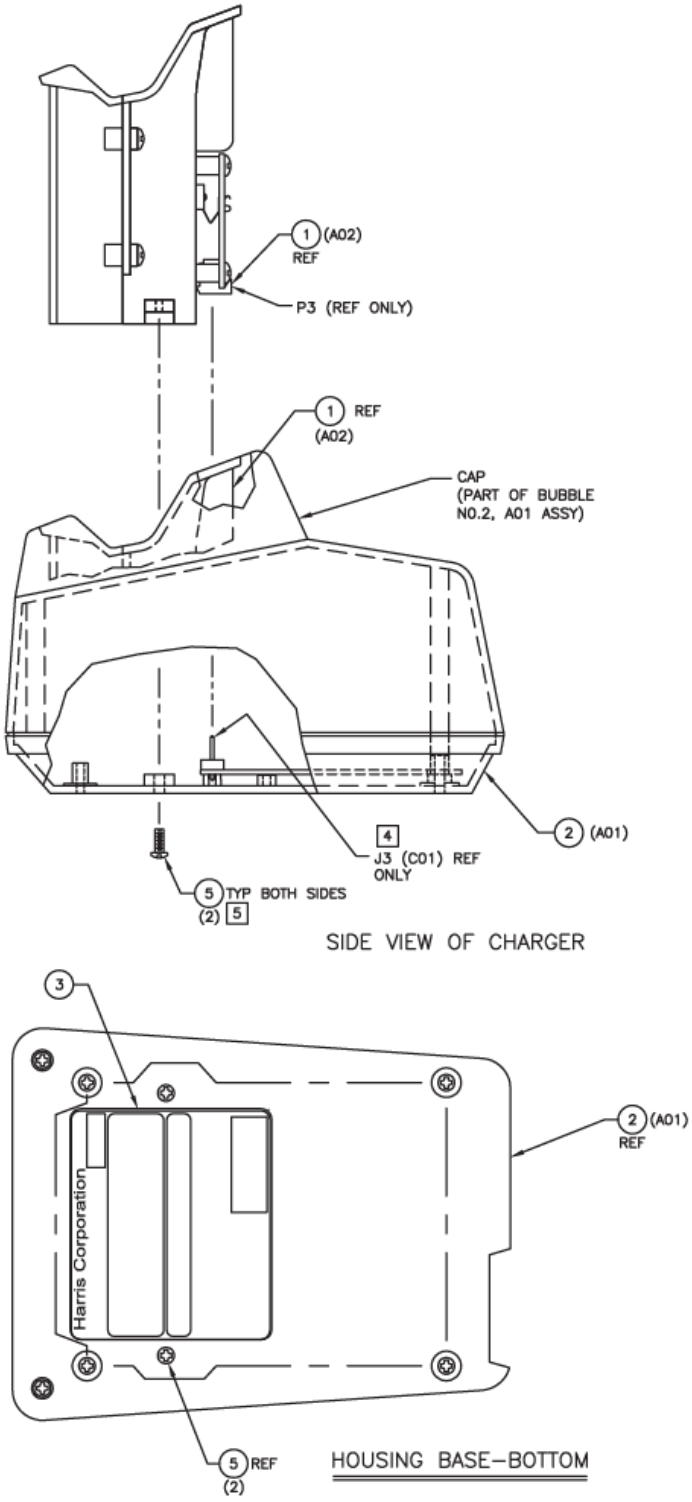
9.1 PARTS LIST

BASE ASSEMBLY CH-104560-xxx
R8263-A01 Rev. D

REF DES	DESCRIPTION
1	Housing Case Base
2	Housing Case Body
3	Housing Case Cap
5	Main Circuit Board Assembly, R8263-C01
8	LED Circuit Board Assembly, R8263-C03
9	Label, LED Nameplate
10	Label, Caution

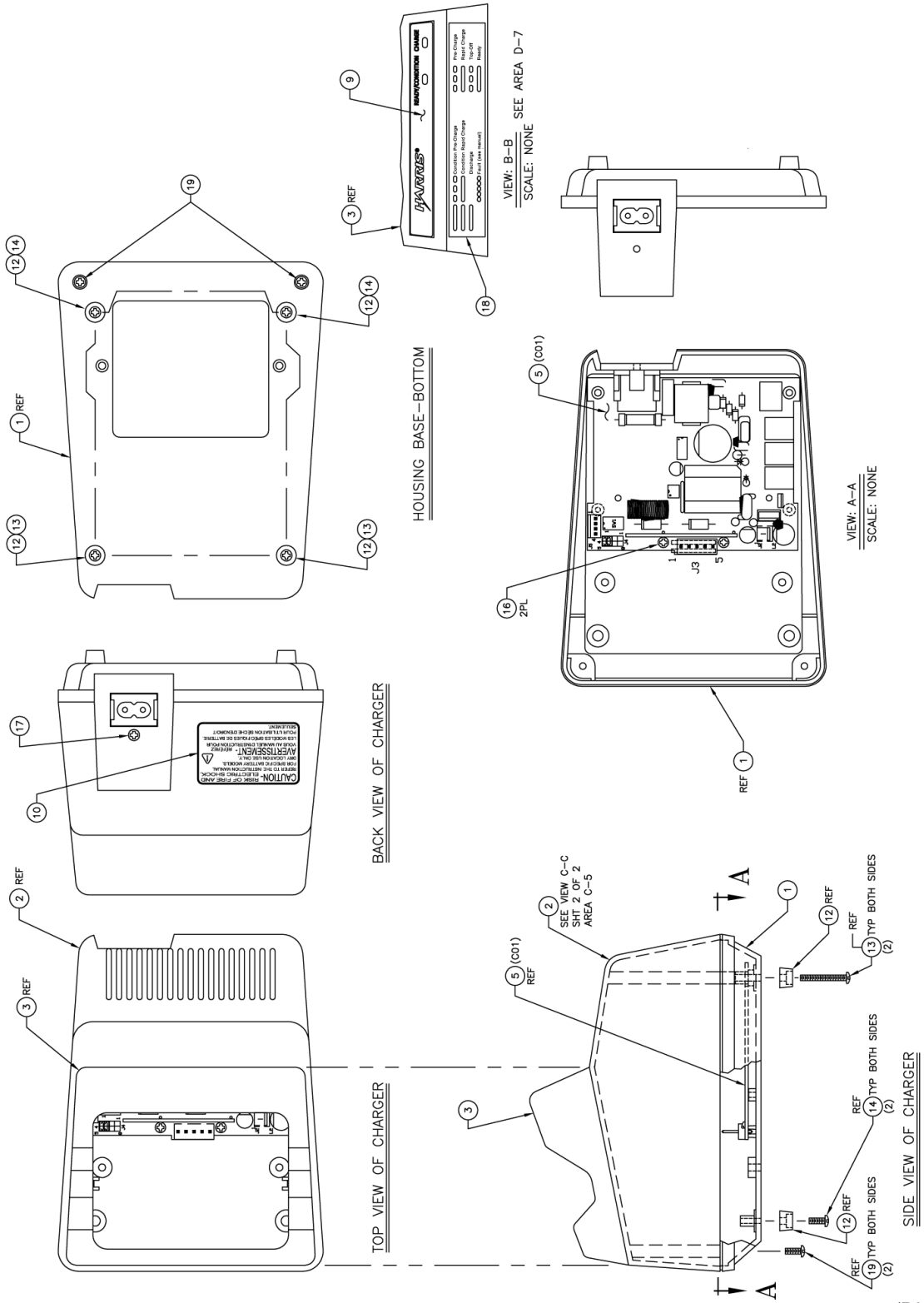
REF DES	DESCRIPTION
12	Bumper Rubber Foot .26IN, 4 EA
13	Screw M3X25 PH BLK, 2 EA
14	Screw M3X8 PH BLK, 7 EA
16	Screw M3X6 PH CL, 2 EA
17	Screw M3X8 FL BLK
18	Label, Charger Legend
19	Screw 4-20X.375 Tamper Proof, 2 EA

9.2 ASSEMBLY DIAGRAM



(BTCR CRGRD-P53-S, Rev. D)

9.3 CHARGER BASE CH-104560-020



(R8263-A01, Sh. 1, Rev. D)

10. MAIN BOARD

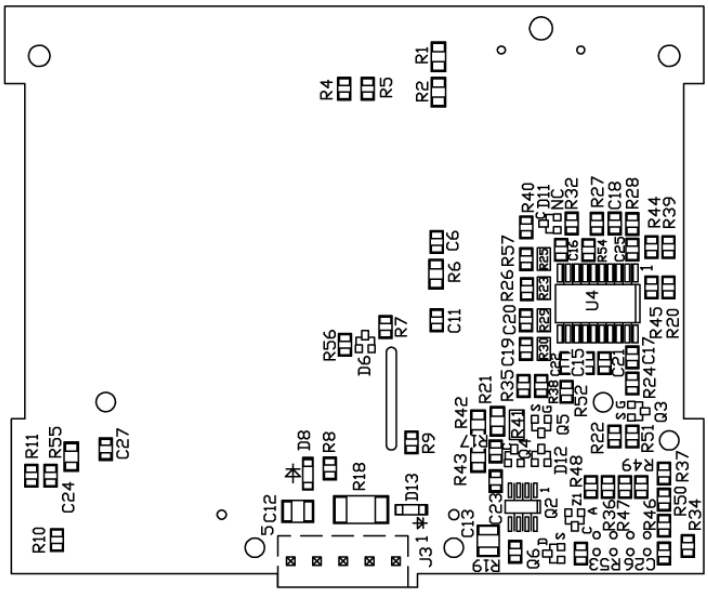
All components in the following parts lists are for reference only or are considered common parts available from your local electronic parts distributor.

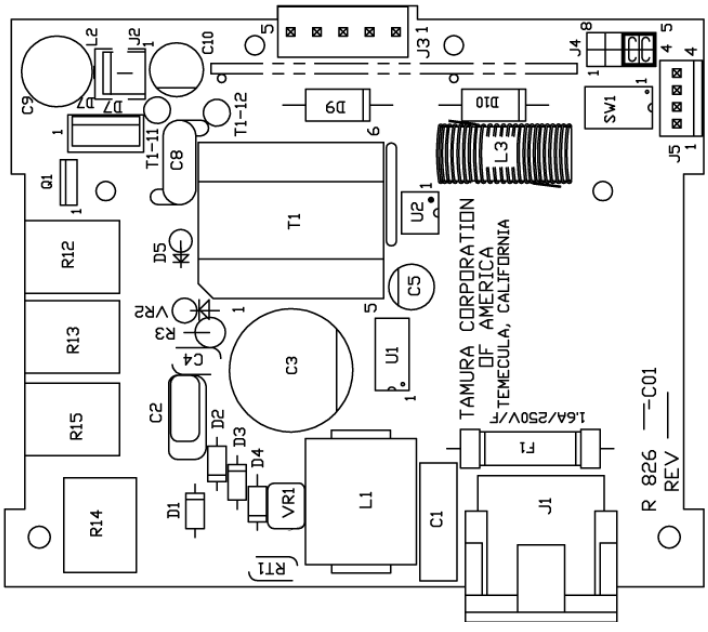
10.1 PARTS LIST

MAIN CIRCUIT BOARD ASSEMBLY
R8263-C01, Rev. F

REF DES	DESCRIPTION
CAPACITORS	
C1	Capacitor, 0.1 µF, 250V
C2	Capacitor, 0.1 µF, 400V
C3	Capacitor, 68 µF, 400V
C4	Capacitor, 0.001 µF, 500V
C5	Capacitor, 47 µF, 25V
C8	Capacitor, 2.2 nF, 250V
C9	Capacitor, 470, 25V
C10	Capacitor, 220 µF, 35V
DIODES	
D1	Diode, 1A, 1000V
D2	Diode, 1A, 1000V
D3	Diode, 1A, 1000V
D4	Diode, 1A, 1000V
D5	Diode, 1A, 1000V
D7	Diode, 10A, 100V
D9	Diode, 3A, 40V, Schottky
D10	Diode, 3A, 40V, Schottky
FUSES	
F1	Fuse, 1.6A
CONNECTORS	
J1	Receptacle, AC Inlet 2 Circuit
J3	Connector, 5 Circuit Header Gold
J4	Connector, 8 Circuits Dual Row
J5	Connector, 4 Circuits with Lock
	Jumper, 2 Circuits Dual
INDUCTORS	
L1	Inductor, 18 mH, 0.5A
L2	Choke
L3	Choke
TRANSISTORS	
Q1	Transistor, FET,11A, 60V, N-Channel
RESISTORS	
R3	Resistor, 82 kohms, 2WM, 5%
R12 thru R15	Resistor, 30 ohms, 5W
RT1	Thermistor, 4 ohms, 3A
SWITCHES	
SW1	Switch, 3 Position Dip Switch
INDUCTORS	
T1	Transformer,
INTEGRATED CIRCUITS	
U1	IC, 26W
U2	IC, Optocoupler, PS2561L1, 4PN
VARISTORS	
VR1	Varistor, 10A, 510V
VR2	Transorb, 200V, 2.1A, 600W

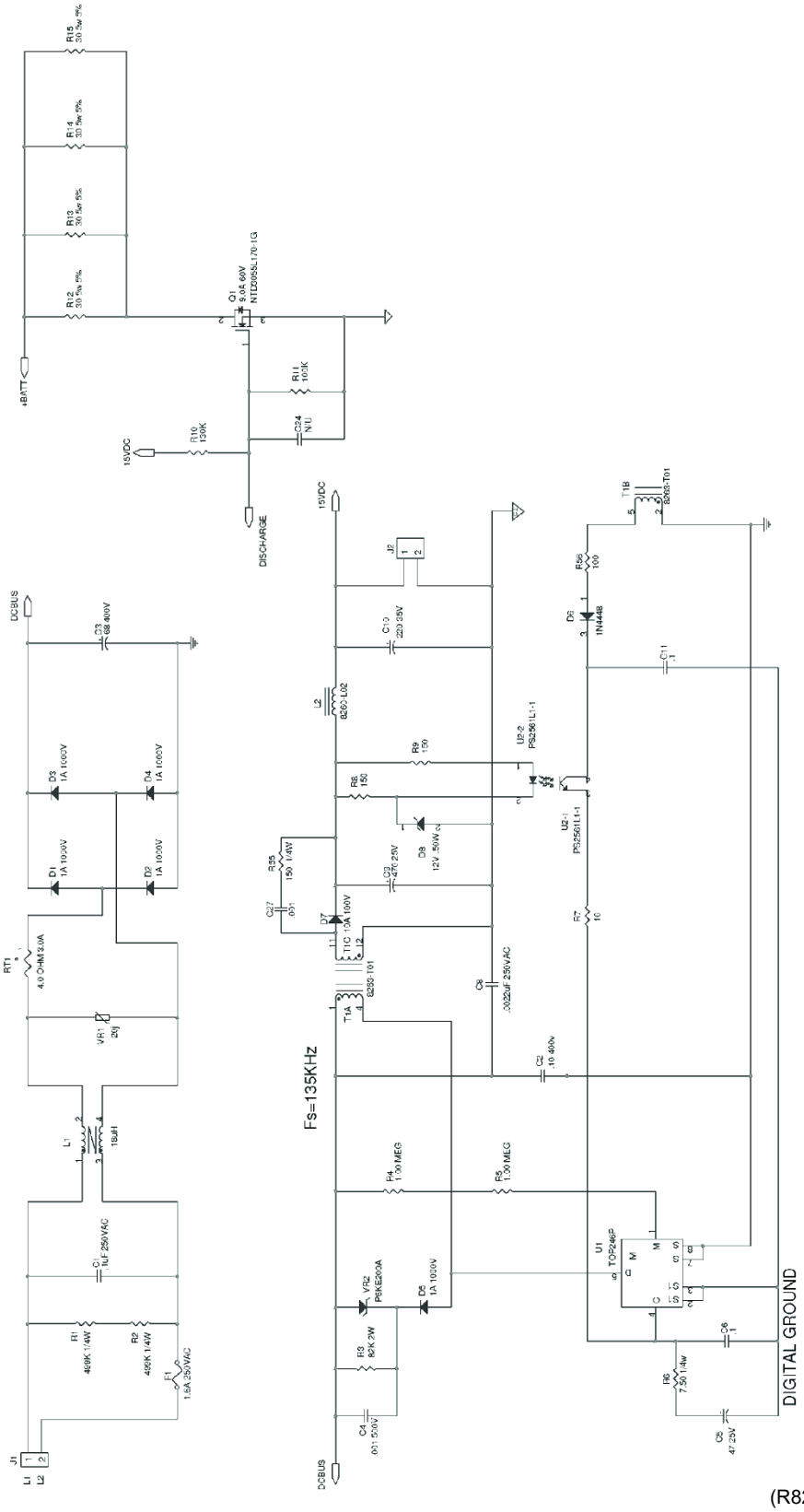
10.2 OUTLINE DIAGRAM



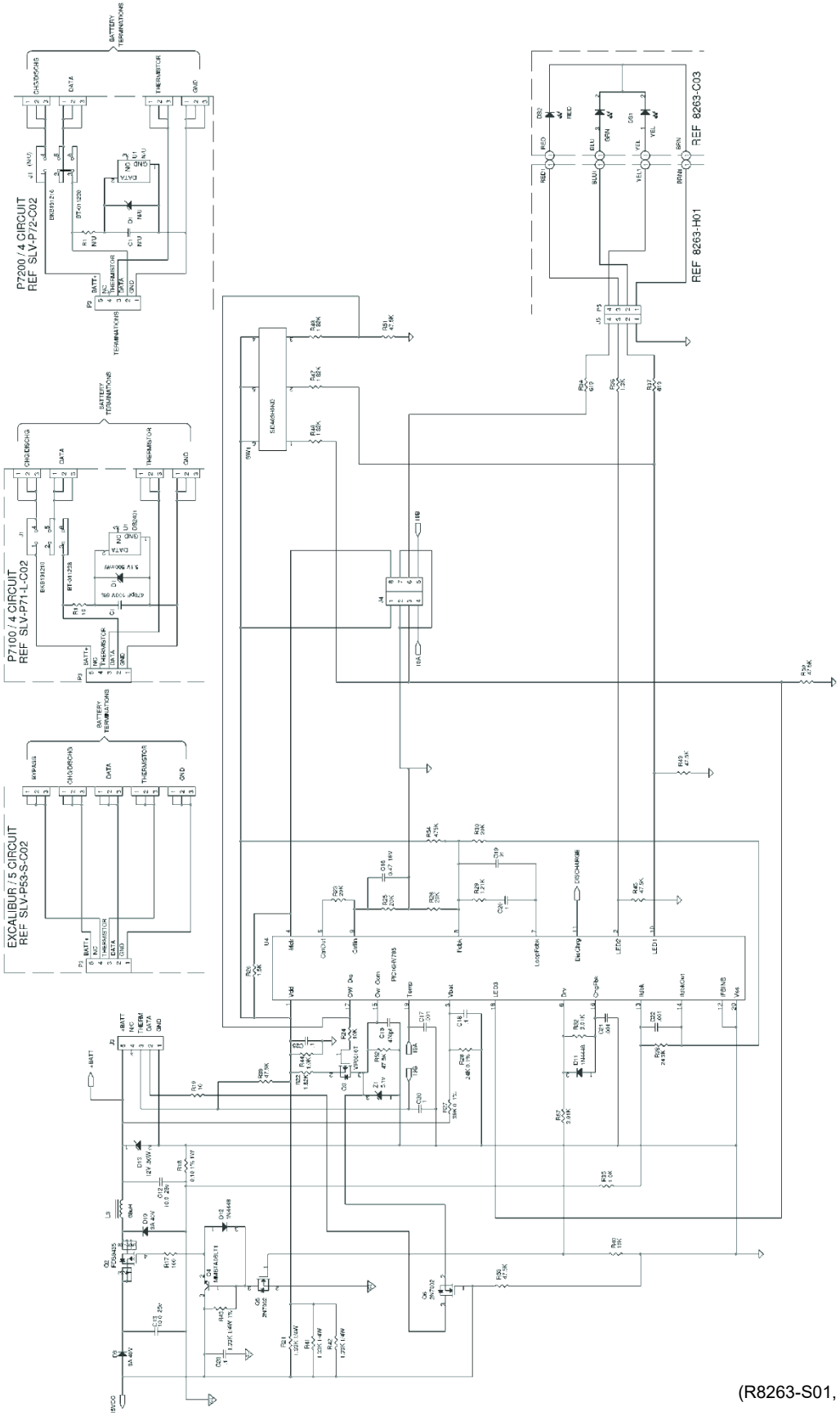


(R8263-C01, Sh. 1, Rev. D)

10.3 SCHEMATIC DIAGRAM



(R8263-S01, Sh.1, Rev. C)



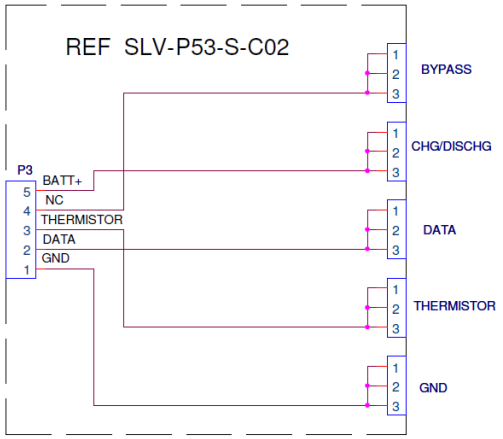
(R8263-S01, Sh.2, Rev. C)

11. SLEEVES

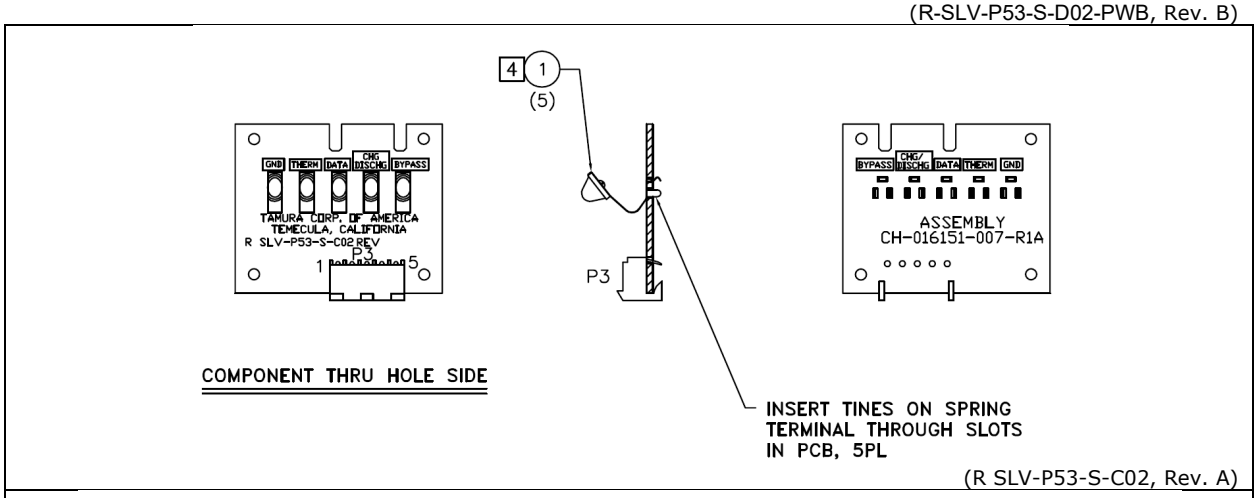
11.1 CHARGER SLEEVE CH-104151-007

R SLV-P53-S-A02, Rev. D

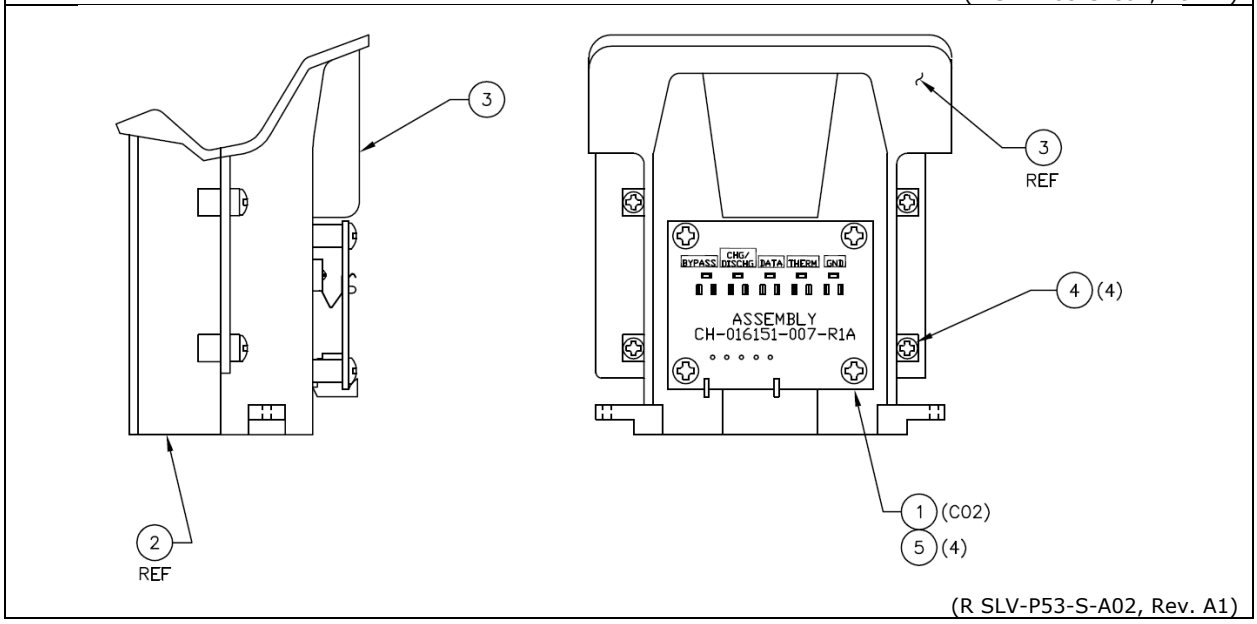
REF DES	DESCRIPTION
1	Contact, Spring (Qty: 5)
1	Sleeve Circuit Board Assembly
2	Housing Front
3	Housing Back
4	Screw M2.6X10 Pan (Qty: 4)
5	Screw M3X8 PH CL (Qty: 4)



(R-SLV-P53-S-D02-PWB, Rev. B)



(R SLV-P53-S-C02, Rev. A)

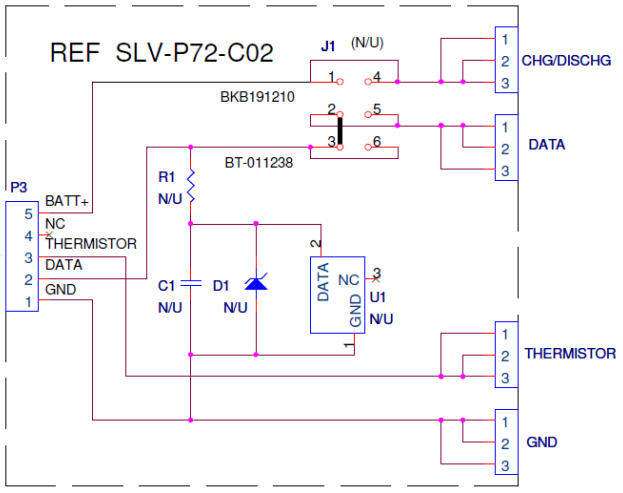


(R SLV-P53-S-A02, Rev. A1)

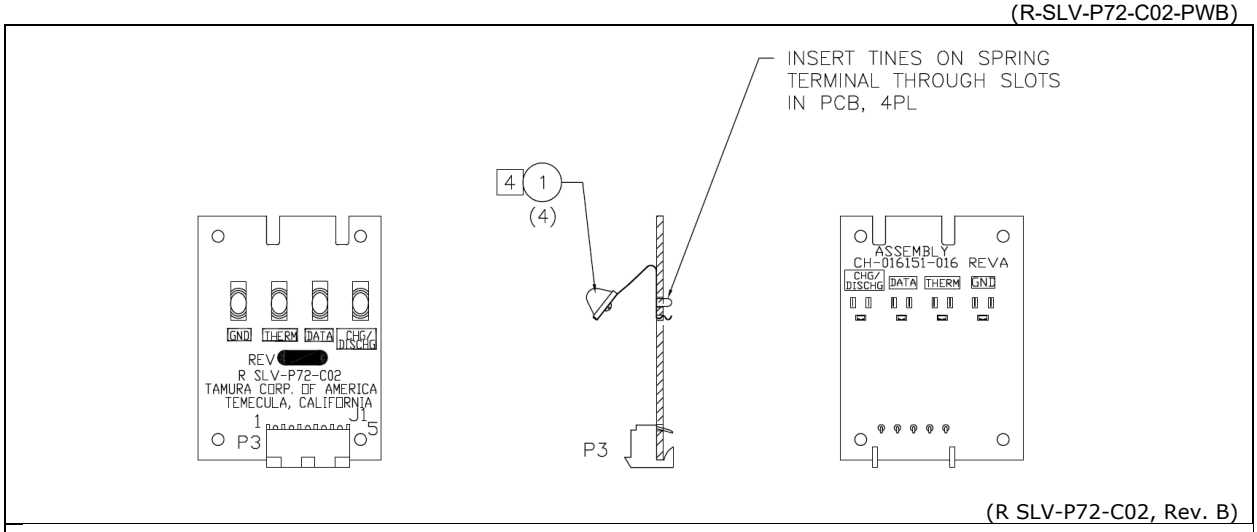
11.2 CHARGER SLEEVE CH-104151-016

R SLV-P72-A02, Rev. C

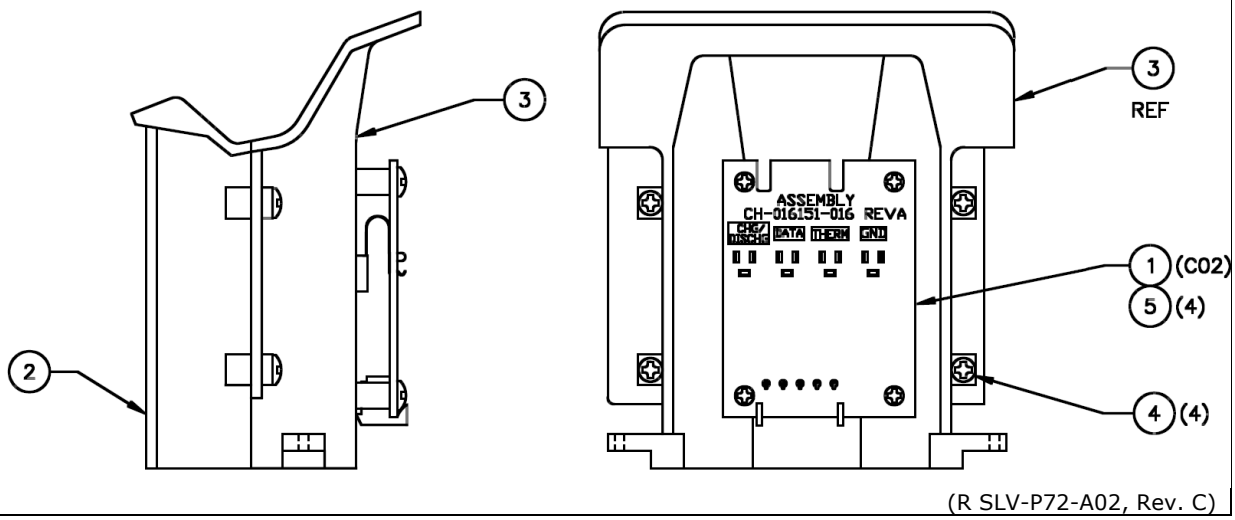
REF DES	DESCRIPTION
1	Contact, Spring (Qty: 4)
1	Sleeve Circuit Board Assembly
2	Housing Front
3	Housing Back
4	Screw M2.6X10 Pan (Qty: 4)
5	Screw M3X8 PH CL (Qty: 4)



(R-SLV-P72-C02-PWB)



(R SLV-P72-C02, Rev. B)



(R SLV-P72-A02, Rev. C)

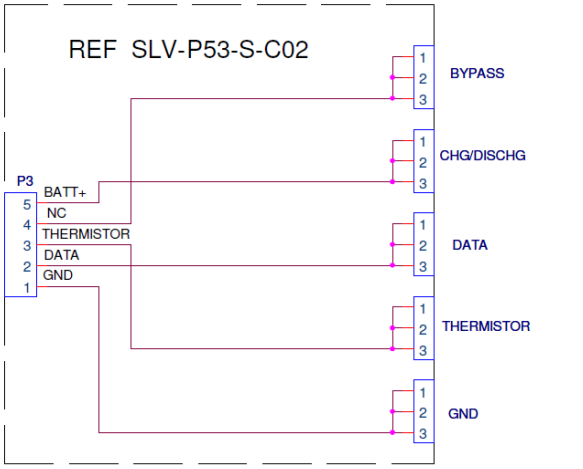
11.3 CHARGER SLEEVE CH-104151-017

NOTE

The -017 sleeve is the same as the -007 sleeve except for the front housing which is specifically designed for the XG-25P radio.

R SLV-P53-S-A02, Rev. D

REF DES	DESCRIPTION
1	Contact, Spring (Qty: 5)
1	Sleeve Circuit Board Assembly
2	Housing Front (for -017)
3	Housing Back
4	Screw M2.6X10 Pan (Qty: 4)
5	Screw M3X8 PH CL (Qty: 4)



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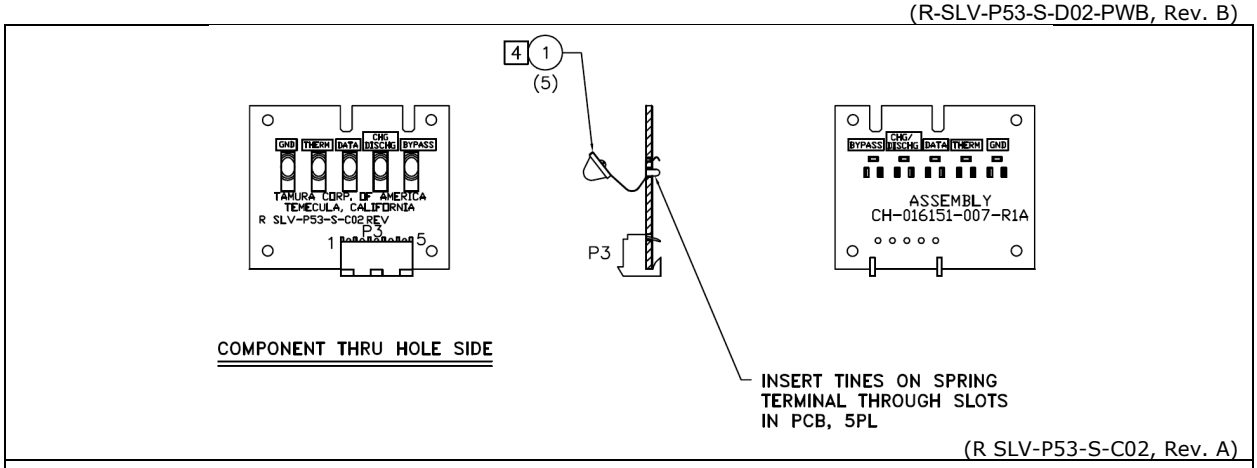

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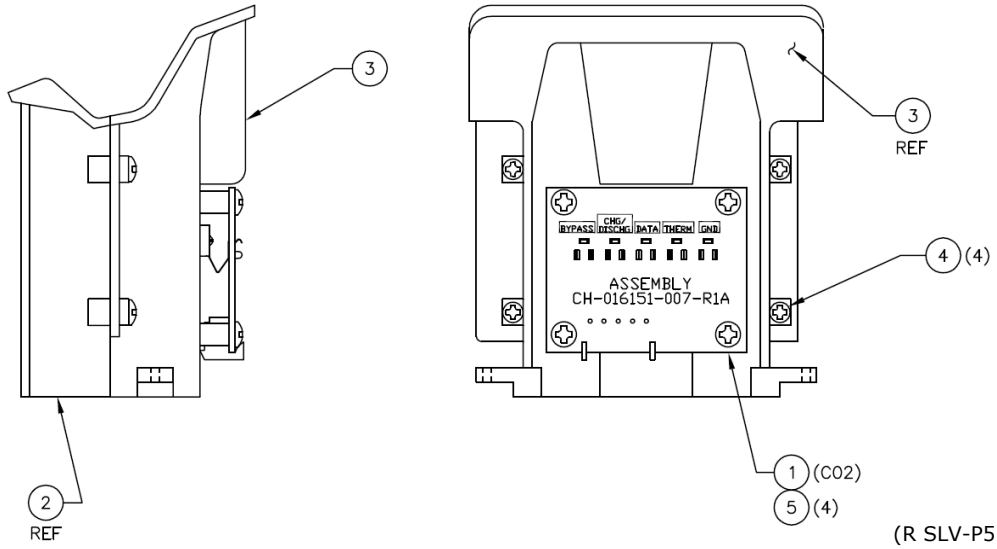
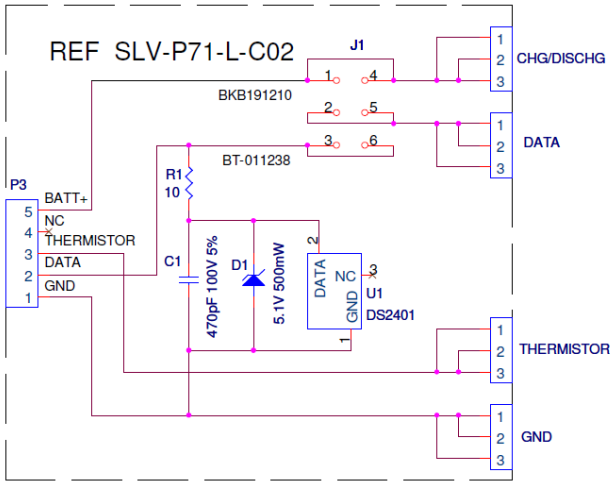


(R SLV-P53-S-A02, Rev. A1)

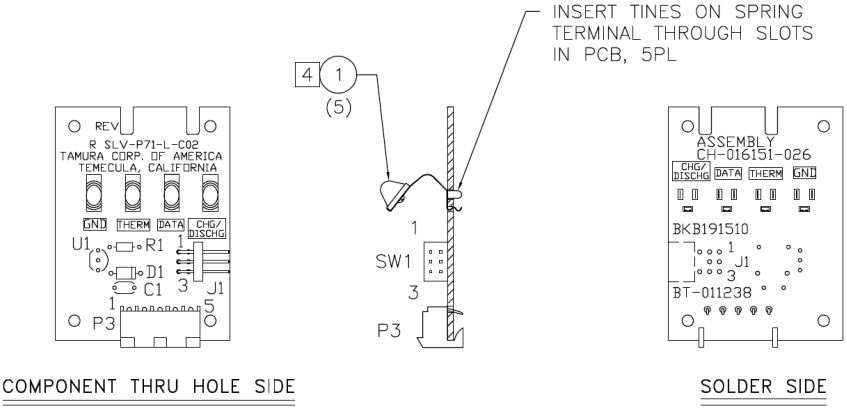
11.4 CHARGER SLEEVE CH-104151-026

R SLV-P71-L-A02, Rev. A1

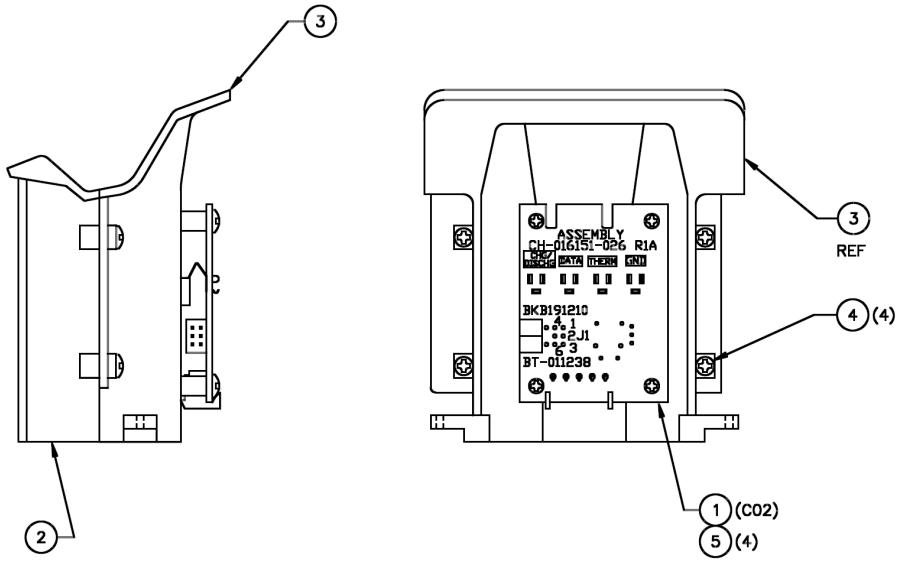
REF DES	DESCRIPTION
1	Contact, Spring (Qty: 4)
1	Sleeve Circuit Board Assembly
2	Housing Front
3	Housing Back
4	Screw M2.6X10 Pan (Qty: 4)
5	Screw M3X8 PH CL (Qty: 4)



(R-SLV-P71-L-C02-PWB)



(R SLV-P71-L-C02, Rev. A)

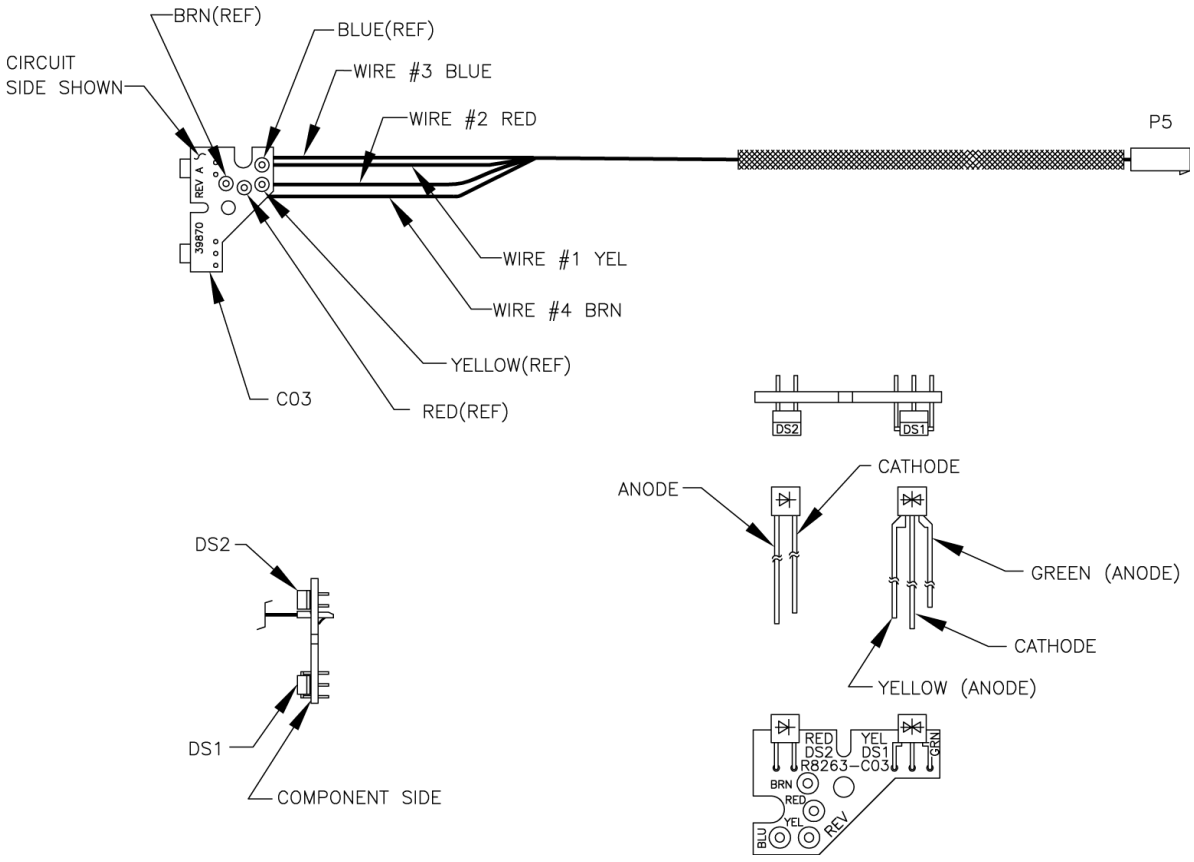


(R SLV-P71-L-A02, Rev. A1)

12. LED ASSEMBLY

R 8263-C03 LED, Rev. E

REF DES	DESCRIPTION
DS2	LED Indicator, red
DS1	LED Indicator, orange/green dual



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About L3Harris Technologies

L3Harris Technologies is an agile global aerospace and defense technology innovator, delivering end-to-end solutions that meet customers' mission-critical needs. The company provides advanced defense and commercial technologies across air, land, sea, space and cyber domains.