



BLUELINE

THE NEXT STAGE IN LITHIUM

Modular Material Handling Batteries


Operating Manual





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24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

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1. Introduction

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)



1.1 Purpose & Scope

This Operating Manual is written for lift-truck operators and facility supervisors who use Blue Line Battery’s modular lithium-ion motive-power packs in electric counterbalance and warehouse vehicles. Its goal is to provide the day-to-day information you need to operate, charge, inspect, and store the battery safely and efficiently. Tasks that involve opening the enclosure, changing parameters, or replacing components are outside this document’s scope and are covered in the separate Technician/Service Manuals.

What the Manual Covers:

- Pre-shift visual checks, normal start-up/shutdown, and basic indicator meanings
- Approved charging equipment and best-practice charging routines
- Operator-level responses to low-state-of-charge, temperature, or fault messages
- Storage, cleaning, and transportation guidelines

Battery Families Included

Nominal Voltage	Series Cell Count	Typical Truck Classes*
24 V		Class III walkies / rider pallet trucks
24 V-36 V		Class II narrow-aisle reach & turret
36 V-48 V		Class I sit-down counterbalance

*Equipment examples are illustrative; always verify compatibility with the truck data plate.

Each pack integrates a Battery Management System (BMS) that interfaces with CAN communications, enforcing voltage, temperature, and current limits in real time.





1. Introduction

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)



1.2 Using This Manual

Follow the chapters in order when onboarding new operators, then keep the Quick-Reference section with the truck documents for daily use. If a situation arises that is not addressed here—or if any red fault indicator persists after you have followed the listed operator actions—remove the pack from service and contact Blue Line Battery technical support or a qualified service technician.

By confining this manual to operator responsibilities and referencing service documentation for deeper interventions, we ensure safe, clear, and compliant use of Blue Line Battery products.





2. Safety

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

2.1 Safety Fundamentals (Operator-Level)

The battery in your truck contain high-energy, high-voltage lithium-ion modules. Follow the rules below at all times; if a situation is not covered here, remove the pack from service and call Blue Line Battery support.

2.2 Personal Protective Equipment (PPE)

Always wear safety glasses when connecting and disconnecting the battery. Do not touch the battery contacts. Remove all metal jewelry before touching the cables or connector.

2.3 Handling & Housekeeping

Keep liquids—water bottles, solvents, pressure-wash hoses—away from the pack. Clean only with a lightly moistened microfiber cloth; spray the cloth, never the battery.

Do not lift, tilt, or strike the pack with forks or chains. A battery that is dented, cracked, or no longer meets the truck's counterbalance weight must be taken out of service.

If you see corrosion or water residue, treat the unit as unsafe and notify maintenance.

2.4 Electrical Precautions

Turn the truck key OFF and wait for all indicator lamps to extinguish before plugging or unplugging the main connector.

Never attempt to open the battery enclosure; only certified technicians may do so.



2. Safety

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2.5 Fire, Odor, or Smoke

A sweet or “fruity-solvent” smell, hissing, swelling, or smoke means cell damage—evacuate the area, call 911, then Blue Line Battery.

Use a Class D extinguisher for lithium fires; use Class C only for electrical-equipment fires. Water must not be used to suppress burning cells.

If the truck or battery flips, clear an exclusion zone, call emergency services, and keep personnel clear until responders arrive.

Abiding by these fundamentals protects personnel, equipment, and facility assets while meeting Blue Line safety requirements.



2. Safety

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Please read and understand the following warning label.
Reach out to Blue Line Battery if you have any questions.



WARNING

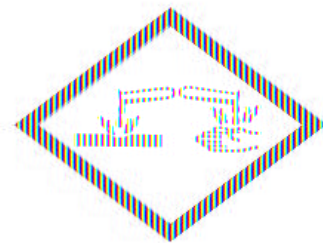
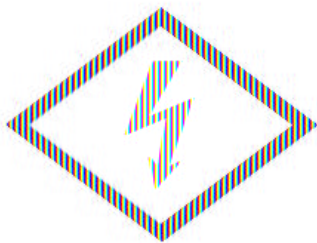
CONTAINS LITHIUM. FIRE, BURNS, OR EXPLOSION

To avoid electric shock or injuries:



BLUELINE
THE NEXT STAGE IN LITHIUM

- DO NOT puncture battery.
- DO NOT short battery terminals.
- DO NOT expose battery to high temperatures or open flame.
- DO NOT reverse connections (polarity) from charger to battery.
- DO NOT disassemble battery or remove its cover or coverings.
- DO NOT use battery beyond temperature, voltage, and current ratings.
- Only certified technicians should service this battery.
- Avoid contact with electrolyte. If contact occurs, flush with water.
- Keep battery away from children.
- Battery must be recycled appropriately.



Blue Line Battery, Inc. (262) 235-3360 www.bluelinebattery.com

3. Pack Identification & Ratings

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)





Pack Identification & Ratings

Every Blue Line pack carries two permanent printed labels on the side of the tray: a Data/Traceability label and a Safety Warning label. Verify both before the battery goes into service.

3.1 Data / Traceability Label

This label is laser-printed on white polyester and includes a QR code that links operators to on-line manuals and quick-start videos.

Operator check: confirm Nominal Voltage and Service Weight match the truck, then scan the QR code and bookmark the landing page for future reference.

 BLUELINE <i>THE NEXT STAGE IN LITHIUM</i>	
Serial Number	38033-1
Minimum Voltage	72.6 V
Maximum Voltage	92.4 V
AH Capacity	693 AH
Weight	4366 LBS
Battery Model	85-17
Part Number	10017831
Manufacture Date	5-22-2025-2025
<p>Scan for Service information, Warranty, Storage Instruction, Chemtrec, SDS, User Manual, ETC</p> 	





4. System Overview

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

4.1 What's inside the battery?

Your Blue Line pack is a self-contained power module made of:

- Cell modules – lithium-ion “blocks” wired in series to reach 24 V (7 s), 36 V (10 s) or 48 V (14 s).
- A Battery-Management System (BMS) – the on-board computer that measures every cell, controls two heavy-duty contactors, houses the main fuse and 12 V logic supply, and sends data to the truck over CAN.
- A harness to connect cell modules together
- Counterweight in the form of steel bars
- Harnesses to connect to the truck and charger

Everything sits in a welded steel tray that also provides the counter-balance weight the truck expects.

4.2 Your “fuel gauge” – the BDI

On CAN-Integrated trucks the Battery-Discharge Indicator (BDI) or dashboard gauge shows Customer State-of-Charge (CSOC) from 100 % (full) down to 0 % in 1 % steps. The BMS calculates CSOC and broadcasts it to the truck; the truck simply paints the bar or percentage you see.



4. System Overview

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4.3 Low-SOC protection states

To protect the pack and keep you from being stranded, the BMS flips two “warning bits” that the truck understands:

State	When it happens	What you’ll notice	What to do
Lift Lockout	CSOC \approx 4 %	(setting can vary by truck)	Hoist function disabled; truck still drives
Limited Operation	CSOC \approx 2 % or certain non-critical faults		Hoist disabled and travel speed reduced (“limp-home”)
			Go directly to charger or maintenance area

These transitions are handled automatically in the order above. The truck resets them once the battery is re-charged.

4.4 Turning the battery ON and OFF

An ON-OFF rocker switch is located on the pack cover next to the main connector:

ON – Flip the switch up. You will hear a soft click from the contactors and the truck display powers up.

OFF – Turn the truck key off, wait a few seconds for displays to go dark, then flip the switch down. This isolates the pack for charging, storage, or service.

That’s it—no other controls are required. Once the pack is on, the truck and BMS handle everything automatically until you shut it off or reach the Lift-Lockout/Limited-Operation thresholds.



5. Installation and Vehicle Setup

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

Installation & Vehicle Setup — step-by-step for the truck bay

5.1 Pre-checks (on the floor)

Read the data label: confirm voltage (24 / 36 / 48 V) and service weight match the truck plate. A battery that is too heavy or too light will upset stability — do not proceed if it is out of range.

Inspect connectors: look for flipped pins or damage on the SBX / Euro-320 plug; correct orientation shows the APP logo, not the “SBX 350 4/0” text.

Switch the battery OFF and turn the truck key OFF before lifting.

5.2 Lifting & placement

Pick up the battery by the lifting eyes, using an appropriate lifting method.

Lower the pack into the compartment slowly. The pack should sit square with no more than a finger-width of free space on either side. If there is a gap that lets the pack rattle, wedge non-conductive shims (corrugated plastic, rubber, wood) between tray and compartment wall.

Engage the truck’s vertical-retention bar or rear-stop plate so the battery cannot hop when braking.



5. Installation and Vehicle Setup

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5.3 Cable & connector hook-up

Main power connector:

Confirm correct style (SB350, SBX350, or Euro-320) and that cable length allows a natural bend—no kinks, no tension. Minimum bend radius follows the cable spec; as a rule of thumb stay above 5 × cable diameter.

CAN/charge harness:

Route the 6-pin Deutsch or CAN pigtail so it never lies parallel to orange traction cables; cross at right angles if paths meet. Harness must be shielded, two twists per inch, shield bonded to chassis at both ends.

5.4 Functional power-up

Flip the battery switch ON—you'll hear the contactors close.

Turn the truck key ON. The dash Battery-Discharge Indicator should populate within 2 seconds; if it stays blank or flashes a fault, re-check the CAN plug and ground strap.

Tug both power and CAN leads gently—there should be no movement at the housings. Zip-tie slack so nothing rubs sharp edges.

Installation is now complete. Record the battery serial number and truck hours for your maintenance log, then hand off to the operator.



6. Startup and Shutdown Practices

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Follow the steps below exactly each shift; they cover normal use, charging hand-off, and fault shutdowns. If anything behaves differently, remove the pack from service and call Blue Line support.

6.1 Normal Power-Up

Check connections – connector fully seated, ground strap secure.

Flip the battery switch to ON. You should hear one soft click as the BMS closes its contactors; the pack is now live.

Turn the truck key ON. Within ~2 s the dash Battery-Discharge Indicator (BDI) should populate; if it stays blank or flashes a fault, see Section 11.

6.2 Normal Power-Down

Park, lower forks, set the parking brake.

Turn the truck key OFF and wait until the dash goes dark.

Flip the battery switch to OFF. The contactors open and the plugs are de-energised—wait at least 5 s before unplugging.

6.3 Connecting a Charger

Plug in the charger only after the key is OFF; the battery must remain ON.

The BMS sets the “Charger Connected” bit to 1 and disconnects the truck.

When charging is finished and the charger disconnects, power is automatically reconnected to the truck.



6. Startup and Shutdown Practices, Continued

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

6.4 Soft-Shutdown (BMS-initiated)

If the BMS detects a condition that requires an orderly stop—over-temperature, internal fault, etc.—it sends a Soft-Shutdown command:

Sets Inhibit Operation; truck stops lifting/driving but electronics stay powered for ≤ 28 s.

After the 28 s timer, sets Immediate Shutdown; contactors may open.

Operator action: steer to a safe stop and wait; do not cycle power until the truck display is dark.

6.5 Recovery After a Soft-Shutdown

Once the fault clears (or service has addressed it):

Flip the switch OFF, wait 5 s, then ON again.

Verify the dash powers up and no red LED remains.
If the pack will not re-start, tag it out and call Blue Line service.

6.6 Emergency / Immediate Shutdown by Operator

If you smell solvent, see smoke, or the truck alarms:

Key OFF → battery switch OFF.

Unplug the main connector.

Tag the battery Do Not Use and move people clear.

These procedures keep both battery and truck within safety rules while giving you predictable, repeatable starts and stops every shift.



7. Charging Guidance

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

Charging Guidance — how to top-off safely and quickly

**Approved charger families (with correct firmware & wiring):
Ecotec, EcoCharge, Webasto, PosiCharge, and ACT.**

Any other brand must receive written approval from Blue Line Battery before use.

7.1 Before you plug in

1. **Key OFF – battery may stay ON.** Always shut the truck down first; this prevents arcing at the connector.
2. **Inspect the connector.** Pins must be straight and clean; the Euro 320 plug must contain the factory “loop-back” jumper between the two large auxiliary pins (it tells the BMS a charger is present).
3. **Check the nameplate.** Never exceed the “Max Charge Current” printed on the data label—doing so voids warranty.

Parameter	Value / Rule	Notes
Output profile	CC/CV (constant current, then constant voltage)	No pulsating or taper-only profiles; unstable AC chargers can overheat cells.
Charge-current limit	\leq label rating (A)	Many Ecotec & EcoCharge units auto-read pack size; verify.
Final voltage	<i>Max Voltage</i> on label ($\approx 4.00 \text{ V} \times$ series-cells)	Do not raise firmware cut-off above this.
Cell safety window	Never charge cells $< 2.9 \text{ V}$ or $> 4.2 \text{ V}$	BMS blocks charge outside this range, but charger must also respect it.



7. Charging Guidance

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7.2 Connecting & charging

1. **Mate the plug firmly;** you should feel the plug seat firmly.
2. The BMS senses the loop-back, sets the “Charger Connected” bit to 1, and disconnects the forklift.
3. Charger ramps to set current; pack fans may run.
4. **Balancing:** once any cell exceeds ~3.8 V the BMS starts active balancing.

7.3 When charging is complete

- Charger displays “Complete” or green LED; current falls near zero.
- Unplug the connector—never yank the cable; grip the housing.
- If the truck does not regain traction, cycle battery switch OFF → ON to reset.



7. Charging Guidance

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7.5 Quick-reference do's & don'ts

- ✓ Use only Ecotec, EcoCharge, Webasto, PosiCharge, or ACT units with correct firmware and settings.

- ✓ Keep the charger area ventilated and equipped with fire suppression.

- ✓ Monitor the first few charge cycles after installing a new charger or changing any settings.

- ✗ **Never** remove the Euro 320 loop-back jumper—the pack will not charge.

- ✗ **Never** charge through the output or truck plug. This can result in an unsafe overcharge condition.

- ✗ **Never** raise voltage or current limits beyond the label.

- ✗ **Never** attempt to charge a pack that smells “sweet/solvent”, is swollen, or is throwing error codes; remove from service and contact Blue Line support immediately.

Following these simple rules keeps the pack within warranty, maximizes cycle life, and ensures traction interlocks work as intended.



8. Discharging and Truck Operation

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8 Discharging & Truck Operation - WITH CAN – what to expect between charger visits

8.1 Usable “fuel” window

100 % → 15 % CSOC – Normal operation. All lift, drive, and regen functions are available.

≈ 15 % CSOC – Lift Lockout. The BMS sets the Lift-Lockout bit; hoist is disabled but you can still drive to a charger.

≈ 5 % CSOC – Limited Operation. The BMS adds the Limited-Operation bit; hoist stays disabled and truck speed/acceleration drop to “limp-home” so you reach a charger without stranding the truck.

0 % CSOC or undervoltage – Soft-Shutdown. If you ignore the warnings, the pack initiates the 28 s soft-shutdown timer, then opens its contactors.

Operator rule: if the dash shows Lift Lockout or Limited Operation, finish the current move, drive straight to the charging area, and plug in.

8.2 Performance at low SOC

Tests confirm that grade-climb, rated-load hoist, and full-speed travel remain available until Lift Lockout is triggered. Once in Lockout or Limited modes the truck’s own controls enforce the reduced performance—no operator override exists.

8. Discharging and Truck Operation

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8.3 Temperature derate (hot or cold days)

To protect the cells, the BMS may gradually throttle power if pack temperature leaves the comfort zone:

Temperature*	Derate action	Dash symptom
> ≈ 45 °C rising to 55 °C	<i>High-Temp Derate</i> bit ramps from 0 % → 100 %	Truck limits speed & lift rate
< ≈ 5 °C falling to -10 °C	<i>Cold-Temp Derate</i> bit ramps 0 % → 100 %	Same as above; clears when pack warms

To protect the cells, the BMS may gradually throttle power if pack temperature leaves the comfort zone:

Derate is linear and clears automatically once temperature returns to normal.

*Exact start/stop points are set in firmware for each pack model; see the data label if needed.

8.4 Regeneration & high-current events

Regen braking / lowering: the BMS accepts energy back into the pack and clips current only if the voltage nears the Max Voltage on the label—operators will not feel a jerk.

Heavy lifts / acceleration: within the usable CSOC window the pack delivers full rated current; the truck meets rated lift speed and top travel speed at Lift-Lockout threshold in forklift tests.



8. Discharging and Truck Operation, Continued

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8.5 Daily do's & don'ts

- ✓ Begin shifts $\geq 50\%$ CSOC if possible; schedule mid-shift “opportunity charges” for heavy two- or three- shift operations.

- ✓ If Lift Lockout appears, clear the bay and head to the charger—don't “just finish one more job.”

- ✓ Allow a few minutes of slow operation after driving in from a freezer so the pack warms before heavy lifts.

- ✗ **Never** run the truck after Limited Operation forces crawl speed; doing so may trigger an automatic shutdown mid-aisle.

- ✗ **Never** bypass thermal derate by cooling with water or heating with space heaters; use the charger's idle time for temperature recovery.

Following these guidelines keeps you inside the approved CSOC and temperature limits, ensuring full truck performance, maximum cycle life, and compliance with Blue Line requirements.



9. Routine Inspection and Cleaning

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

9.1 Start of every shift:

- **Connector & cable check** – no melted housings, flipped pins, or frayed jackets.
- **Case & cover** – no new dents, corrosion, or fluid residue.
- **Smell test** – a “fruity–solvent” odor signals a leaking cell; remove pack from service

Early detection prevents in-aisle failures and flags water damage or cell leaks before they escalate.

9.2 Weekly:

- **Dry wipe-down** – unplug battery, key OFF, then wipe all exposed surfaces with a *lightly* spray-dampened microfiber cloth; spray the cloth, **never the battery**.
- **Clean connector faces** with plastic picks and a dry microfiber to remove dust or oily film.

Prevents conductive grime and moisture ingress.

9.3 Monthly:

- **Torque quick-check** – verify ground-strap bolt and connector latches are snug
 - **Case voltage spot-check** with a handheld meter (expect < 1 V stray).
 - Catches loosening hardware and early insulation issues.
 - **Fans and Dust Ingress:** Inspect under the top cover and vacuum out any dust that has settled due to fan operation.
- ✓ Use only microfiber cloths and mild non-conductive cleaner.
✓ Isolate battery (switch OFF) before any cleaning.
✗ **No hoses, pressure-washers, or direct liquid spray** — water intrusion voids warranty.
✗ Do not use metal tools on live connectors; stick with plastic picks.
✗ If you see corrosion, constant case voltage, or water residue, tag the pack *Do Not Use* and contact Blue Line service.



10. Storage and Transportation

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

10 Storage & Transportation

Proper storage preserves cycle life, while correct packing keeps you in compliance with DOT/UN rules and requirements.

10.1 Short-Term Storage (1 – 3 months)

- Leave the battery **at full charge**, switched **OFF**, and unplugged from the truck.
- Keep indoors between **7 – 32 °C (45 – 90 °F)** in a clean, dry area; avoid direct sunlight or HVAC vents.
- Check the battery weekly; if self-discharge falls below ~30 % SOC, perform a full recharge before placing it back on standby.

10.2 Long-Term Storage (> 3 months)

- Remove the pack from equipment and store it inside the same 7 – 32 °C range.
- Keep it **fully charged** and record the date.
- **Top-off schedule**
Switch **ON** → recharge every **3 – 5 months** → Switch **OFF**.

10.3 Pre-Shipment Inspection

Before shipping to a customer site or back to Blue Line:

- Verify no dents, loose hardware, or “fruity-solvent” odors. Confirm the toggle switch is **OFF** and the main connector is capped.
- Document condition with photos and note the serial number on the bill of lading.



10. Storage and Transportation

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

10.4 Packing & Labelling (UN 3480, Class 9)

- Palletise the battery (or modules) on an undamaged, weight-rated pallet; strap two bands across and two bands length-wise, then apply **four wraps of stretch film**.
- Affix **five Class 9 lithium-battery labels**—one on each exposed face.
- Note “UN 3480, Lithium-Ion Batteries, 9, PG II” and gross weight on shipping documents to satisfy North American and EU rules.

10.5 Regulatory Compliance & Testing

Blue Line packs are compliant to **UN 38.3 Rev 7 transportation tests** and IP-54 splash resistance; no additional shipper testing is required when the battery is intact.

By following these temperature limits, recharge intervals, and packing rules, you ensure the battery arrives ready for service and remains within warranty.



11. Indicators and Basic Operator Troubleshooting

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

All operating information reaches the driver through the truck's own display and audible alarms. If the truck shows a battery-related code or you hear the low-SoC alarm, use the table below. Anything beyond these checks requires the **Service Manual and a technician's diagnostic tools**.

What you see / hear on the truck	Likely cause (operator-level)	Quick action
Battery-Discharge Indicator (BDI) shows $\leq 15\%$ and "Lift Lockout" message	Pack has reached its low-energy safeguard; hoist disabled	Drive at reduced speed to the charger and plug in.
BDI $\approx 2\%$ plus "Limited Operation" or crawl-speed only	Very low SoC; both lift and high-speed travel disabled	Go directly to the charger; do not continue working.
Truck displays "BATTERY FAULT" or similar code on power-up	CAN wiring loose, ground strap missing, or BMS has logged a fault	Key OFF → check connector latch & ground strap → key ON. If code persists, switch pack OFF, tag out, and call service.
Truck will not power after overnight charge; BDI blank	Charger never started or remains connected	Unplug charger, flip battery switch OFF → ON, then key ON. If still blank, contact service.
Current derate	SoC is below 10% or battery is outside temperature limits	Go directly to the charger; do not continue working. If temperature derate, allow battery to return to room temperature.

Any persistent truck code or performance limit that does **not** clear after the simple checks above must be diagnosed with the Technician/Service Manual and the Blue Line diagnostic software. Operators should remove the battery from service, tag it, and notify maintenance rather than attempt further troubleshooting.



12. Warranty and Support Contacts

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

12.1 Standard Limited Warranty

Blue Line Battery warrants each new motive-power pack to be free from defects in workmanship and materials for 72 months (6 years) from the date of purchase. During that period the pack must also retain $\geq 70\%$ of its rated capacity on a full 100 %→0 % discharge performed at 0.1 C.

Key operating conditions:

- Battery must be properly sized for the truck and matched to an approved charger.
- No more than two charge/discharge cycles per 24 h and ≤ 750 cycles per calendar year.
- Cycling must occur between 50 °F – 85 °F ambient, with SoC kept between 10 % and 85 %.

Failure to meet these conditions, evidence of misuse/abuse, water or fire damage, unauthorized repairs, or continued operation after a fault voids the warranty.

12. Warranty and Support Contacts

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12.2 Making a Warranty Claim

- Stop using the battery immediately once a defect is suspected.
- Notify Blue Line within 14 days of discovery and request a Warranty Claim Form
- Provide serial number, operating hours, charger model, and maintenance logs when requested.
- An RMA will be issued if the battery needs to be returned; freight is the owner’s responsibility.

Purpose	Contact	Hours (CST)
Technical support & warranty claims	Phone: 608-927-6695 • Email: service@bluelinebattery.com	07:00 – 17:00 M-F
Sales / application sizing	Phone: 262-235-3360 • Email: sales@bluelinebattery.com	08:00 – 17:00 M-F
Mailing / returns	Blue Line Battery, Inc. • 601 3rd St, Suite 105, Beloit, WI 53511	—

For after-hours emergencies (smoke, fire, major fault), call the service line and follow the voicemail prompts for 24/7 on-call assistance. Keep the battery’s serial number and the truck’s fault code ready when you call; this speeds up troubleshooting and any warranty determination.





13. End-of-Life and Recycling

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)

Lithium-ion motive-power packs contain valuable metals that should be recovered—not land-filled. When your Blue Line battery reaches the end of its service life, follow the steps below to stay compliant with DOT/UN rules and help close the materials loop.

13.1 Remove the Pack from Service

1. **Schedule downtime** so the truck is parked near a pallet station.
2. **Discharge to $\leq 30\%$ SOC** by driving or lifting light loads; this minimizes stored energy for shipping.
3. Turn truck key **OFF**, flip the battery rocker **OFF**, unplug the main connector, and cap it.

13.2 Contact Blue Line for an RMA

Call **608-927-6695** or e-mail **service@bluelinebattery.com** with the serial number, SOC, and visual condition. Blue Line will issue a **Return-Merchandise Authorization (RMA)** and shipping documents or direct you to an authorized recycler.



13. End-of-Life and Recycling

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13.3 Packing & Labelling for Return

- Strap the pack to a rated pallet, four ways, then wrap with stretch film; leave label side visible.
- Apply **UN 3480 Class 9 lithium-battery labels** on at least two sides and attach the RGA paperwork pouch.
- Note “UN 3480, Lithium-ion Batteries, 9” and gross weight on the bill of lading; no additional testing is required because the pack already meets **UN 38.3**.

Route	Region	Notes
Blue Line Take-Back	USA & Canada	Preferred—batteries are routed to contracted recyclers.
Li-Cycle Spoke network	USA (NY, AL, AZ), Canada (ON)	95 % materials recovery via hydrometallurgy; Blue Line is an approved supplier.
Redwood Materials	USA (NV, SC)	Accepted with RMA; focuses on closed-loop nickel, copper, lithium recovery.

If you choose a local recycler, verify they hold an EPA or provincial hazardous-waste permit for lithium-ion batteries and provide a certificate of recycling.



13. End-of-Life and Recycling

24 V, 36 V, and 48 V Modular Batteries (Class 1–3 Equipment)



13.5 Regulatory Snapshot

- **U.S.** – 49 CFR 173.185; classify as “Damaged/Defective” only if the pack is swollen, leaking, or above 30 % SOC.
- **Canada** – TDGR Part 12, Special Provision 138.
- **EU** – ADR P909 and upcoming Battery Regulation (2023/1542) minimum 65 % mass recovery by 2026. cen.acs.org

Return shipping through Blue Line’s program or an authorized recycler ensures valuable metals are reclaimed, hazardous components are neutralised, and you remain fully compliant with safety and environmental legislation.



BLUELINE

THE NEXT STAGE IN LITHIUM

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