AI-04673 Lithium Battery from Ryobi 40v

How to check individual lithium battery lgdaha11865 if still any good. I harvested these batteries from a ryobi 40v dead battery.

Rigel, if you've harvested **LGDAHA11865 cells** from a dead Ryobi 40V pack, the first thing to know is that the Ryobi pack usually fails because **one or more cells have gone bad** or the BMS has locked out the pack. Many of the individual cells may still be perfectly usable.

Safety First

A 40V Ryobi pack is typically made from multiple 18650 cells connected in series. If any harvested cell is:

- Swollen
- Rusted
- Leaking
- Dented on the can
- Hot when sitting unused

then recycle it and do not test-charge it.

Step 1: Measure Open-Circuit Voltage

Using a multimeter:

- Red probe on positive terminal
- Black probe on negative terminal

Record each cell.

What the Voltage Means

Voltage	Condition
4.1V to 4.2V	Fully charged
3.6V to 4.0V	Healthy storage range
3.0V to 3.5V	Usually recoverable
2.0V to 3.0V	Questionable
Below 2.0V	Usually scrap
Below 1.0V	Recycle

When a lithium-ion cell sits below about 2.5-3.0V for a long period, internal chemistry degradation can occur and the cell may become unsafe or lose substantial capacity. [ufinebattery.com], [whalebattery.com], [poweringautos.com]

My personal rule:

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> 3.0V: definitely test further

- 2.0V to 3.0V: test carefully
- <2.0V: recycle

Step 2: Charge Each Cell Individually

Use an 18650 charger such as:

- XTAR
- Nitecore
- LiitoKala
- Opus BT-C3100

Charge at a moderate rate:

- 500mA is ideal
- 1A is acceptable

Watch for:

- Excessive heat
- Failure to reach 4.2V
- Charger error messages

Any cell that gets noticeably hot during charging is suspect.

Step 3: Let It Rest

After charging:

1. Charge to 4.20V
2. Remove charger
3. Let sit overnight (12-24 hours)
4. Measure voltage again

Good

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4.20V → 4.15V to 4.20V
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Bad

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4.20V → 3.90V
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Large voltage drop means high self-discharge and an unhealthy cell.

Step 4: Capacity Test (Best Test)

If your charger supports capacity testing:

1. Fully charge
2. Discharge
3. Recharge

The charger will report mAh.

Rough Guidelines

Measured Capacity	Condition
>80% of rating	Excellent
60-80%	Usable
50-60%	Aging
<50%	Scrap

Step 5: Simple Load Test

If you don't have a capacity tester:

Connect a load such as:

- 12V automotive bulb through an appropriate setup
- Power resistor
- Electronic load

Measure:

- Starting voltage
- Voltage after load applied

Healthy cells maintain voltage reasonably well.

Bad cells immediately sag.

Example:

Good

```
4.15V
↓
3.95V under load
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Bad

```
4.15V
↓
3.20V under load
```

This indicates high internal resistance.

Step 6: Internal Resistance (Professional Method)

An Opus BT-C3100 or LiitoKala engineering charger can measure IR.

Typical healthy recycled 18650:

- Below 50 mΩ: very good
- 50-100 mΩ: usable
- Above 150 mΩ: aging

- Above 200 mΩ: recycle

What I Would Do

Since you're already comfortable with electronics and tinkering:

1. Sort all cells by voltage.
2. Discard any visibly damaged cells.
3. Charge all cells above 2.5V.
4. Let them rest 24 hours.
5. Capacity-test the survivors.
6. Match cells with similar capacity and voltage behavior.

Many people harvesting cells from power-tool packs find that **only one or two cells are bad while the rest remain at 70-90% of original capacity**.

If you can post the voltage readings of all the LGDAHA11865 cells, I can help identify which ones are likely good candidates for reuse and which ones should be recycled.