

MOTOEST.

USER MANUAL

BATTERY MAINTENANCE 101

A GUIDE BY MOTO EST.

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PART 1. MAINTAINING CHARGE

How to keep your battery charged & ready to ride.

FUN FACT: Every time you ride your motorcycle the alternator charges your battery. And every day that you don't ride your bike the battery will drain about 1% charge. So the longer you have your battery charged at its fullest potential, the longer it will last.

1.1 EVERYDAY RIDERS.

The Serial MotoMonogamist.

A healthy, regular relationship between rider and bike will not only benefit your mental wellbeing, it will allow your battery to live life to its fullest potential.

So saddle up and go for a ride, all it takes is a good 'ol 15 mins on the road and that battery will charge back up to its peak performance.



1.2 CASUAL RIDERS.

The Throttle Player.

Batteries don't like being neglected, when they're not being used the life literally gets sucked out of them. To avoid a flat battery and to prolong its lifespan, start your bike up every week or so and let it run on idle for a few minutes, this will allow the charge to regenerate. Your neighbours may not like it but your battery will love you for it, and so will your wallet!

NOTE: If you're lousy at weekly chores and know you'll forget, refer to section [1.4 ALL RIDERS - TLC](#).



1.3 SEASONAL RIDERS.

Holiday Hooners.

Remove the battery now or hook it up to life support!

If your steed isn't being ridden then it's likely your bae (battery) will take it personally.

Picture this: It's a perfect sunny day, you're finally ready enjoy some throttle therapy & mapped out a romantic date with your bike, you gear up to look the part, throw a leg over, insert the key, push her buttons and all you hear is the Click of Death (or nothing at all)... she won't start.

Most batteries will **die after around 2-5 months with no charge and not being run!** To avoid the biggest disappointment of your life, simply remove the battery from your bike (refer to section [3.1 DISCONNECTION & REMOVING](#)) or keep reading to the next section ([1.4 ALL RIDERS // TLC](#)).

1.4 ALL RIDERS.

Tender Love & Care.

Keep your motorcycle happy & ready to roll all year round with a Battery Tender (charger).

Battery tenders are quite like your phone chargers, but smarter and safer! Simply plug the tender in whenever you're not riding and it will automatically power up your bike's battery when required.

Unlike traditional battery chargers, tenders will go into standby mode when your battery's at full capacity and resume charging when needed; an ideal asset to maintaining your battery for long and short term use.



Tender chargers vary in price but are much cheaper than the cost of a new battery; they're compact, convenient and can easily double the lifespan of your battery, **making them one of the most essential and cost effective accessories you can invest in.**

In a nutshell, battery tenders have two parts that plug into each other:

1. **The charging device:** *(think of this part like your phone charger)*
One end connects to a power outlet in your wall, the other end has an open SAE plug.
2. **The quick connect lead, installed to your motorcycle:** *(think of this part like the charging outlet on your phone)*
One end bolts onto your battery terminals and the other has the SAE outlet (usually with a weatherproof cover) which sits in an easy-access location on your motorcycle.

PART 2. DOMESTIC ART

A little bit of upkeep will go a long way and save you some serious coin in the long run.

2.1 BATTERY INSPECTION.

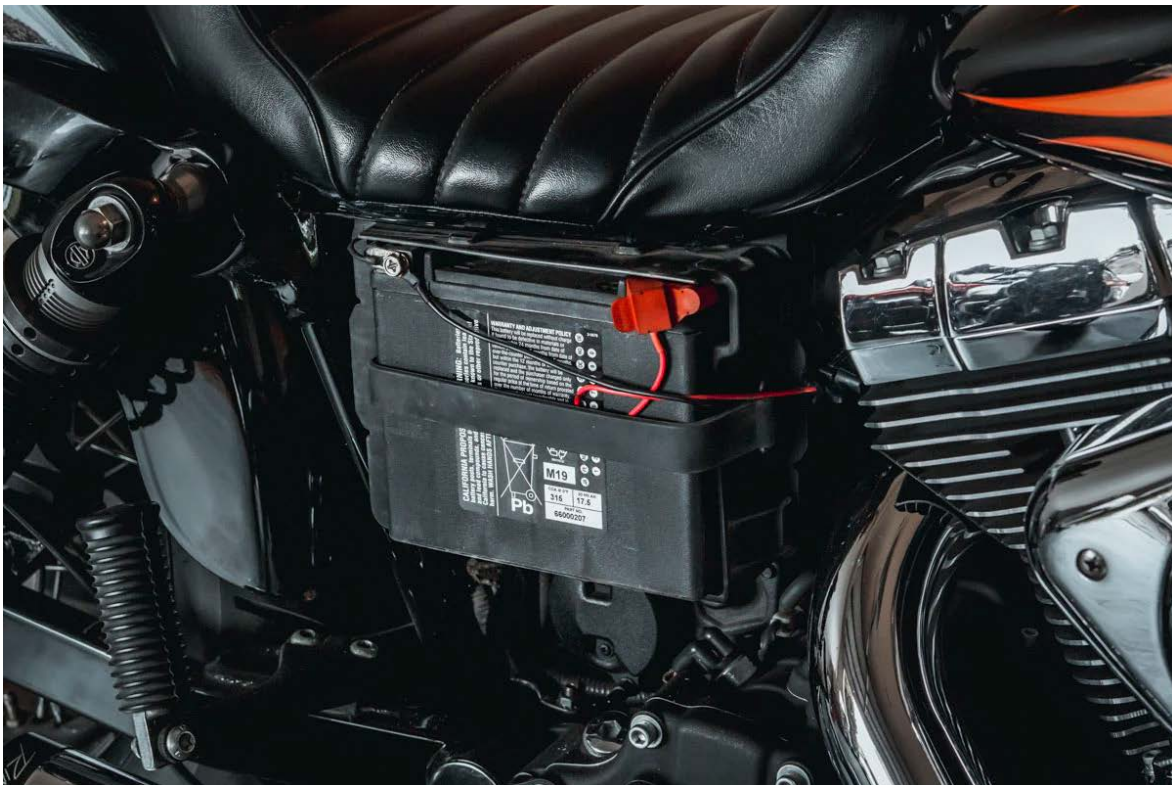
Keep it tight like your throttle grip when hitting the highway.

Engine vibrations can feel good for the rider, but can also provoke a negative (-) effect on your motorcycle's joints.

One common reason for your bike not starting, or only starting intermittently, is loose battery connectors caused by vibrations. Regularly checking to see if the bolts are secured tight, is an easy way to prevent a damaged battery & a grumpy motorcycle.

INSPECTION CHECKLIST:

- Inspect the battery screws, clamps and cables for breakage, loose connections and corrosion.
- Check the battery posts for melting or damage caused by over-tightening.
- Inspect the battery for discolouration, raised top or a warped or distorted case, which might indicate that the battery has been frozen, overheated or overcharged.
- Inspect the battery case for cracks or leaks.



2.2 BATTERY HOUSEKEEPING.

A few tips to clean your crusty bits.

Sometimes water or dirt can get inside the battery casing causing rust or corrosion, which can also cause the battery to discharge. Check the terminals regularly to see if there's any crusty boogers developing and give 'em a good clean when necessary.

HOW TO CLEAN A MOTORCYCLE BATTERY:

1. Remove the battery from your bike ([Refer to section 3.1](#))
2. Clean the battery top with a runny paste of baking soda and water. When the solution stops bubbling, rinse off the battery with a clean, wet rag.
3. Carefully clean the cable connectors and battery terminals using a wire brush or fine sandpaper. Remove any oxidation.
4. Ensure everything is dry & wiped clean then install you battery back into the bike ([Section 3.2](#))



PART 3. TECH SUPPORT

It's tool time! How to remove, install, test, charge and store your battery.

TIP: Knowing your **BLACK** (negative) from **RED** (positive):

Do you get confused which cable to touch first? Just think of the black cable like the main power switch:

TO DISCONNECT: Always switch the **power off first** (remove black), then pull the plug out (remove red).

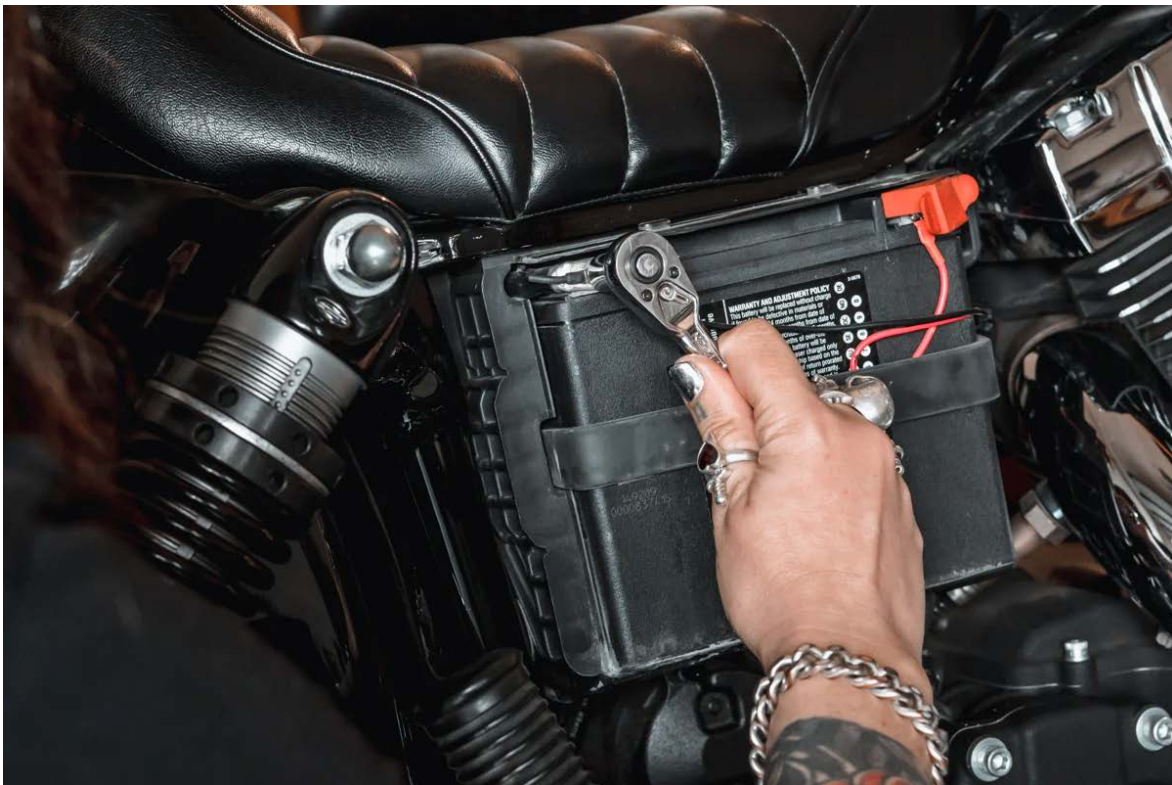
TO CONNECT: Always **plug-in the cord first** (connect red) and then switch the **power on** (connect black).

3.1 DISCONNECTION & REMOVAL.

How To Remove A Battery From Your Motorcycle.

1. Ensure motorcycle is turned OFF
2. Locate your battery (typically under the seat)
3. Disconnect **BLACK** (-) battery cable first.
4. Disconnect the **RED** (+) battery cable.
5. Remove battery strap
6. Remove battery from tray

NOTE: Motorcycles equipped with a security system or alarm may need to remove the main fuse before removal of the battery (refer to your motorcycle's manual for instructions).



WARNING: Always remove the BLACK (-) cable first to break the electrical circuit (disengage the battery). Disconnecting the battery the reverse order can cause dangerous sparks if the live red (+) cable were to make contact with the motorcycle's chassis (*ie/ any grounded surface; including the bike's frame, engine or bolts*), this could result in battery, motorcycle or human damage.

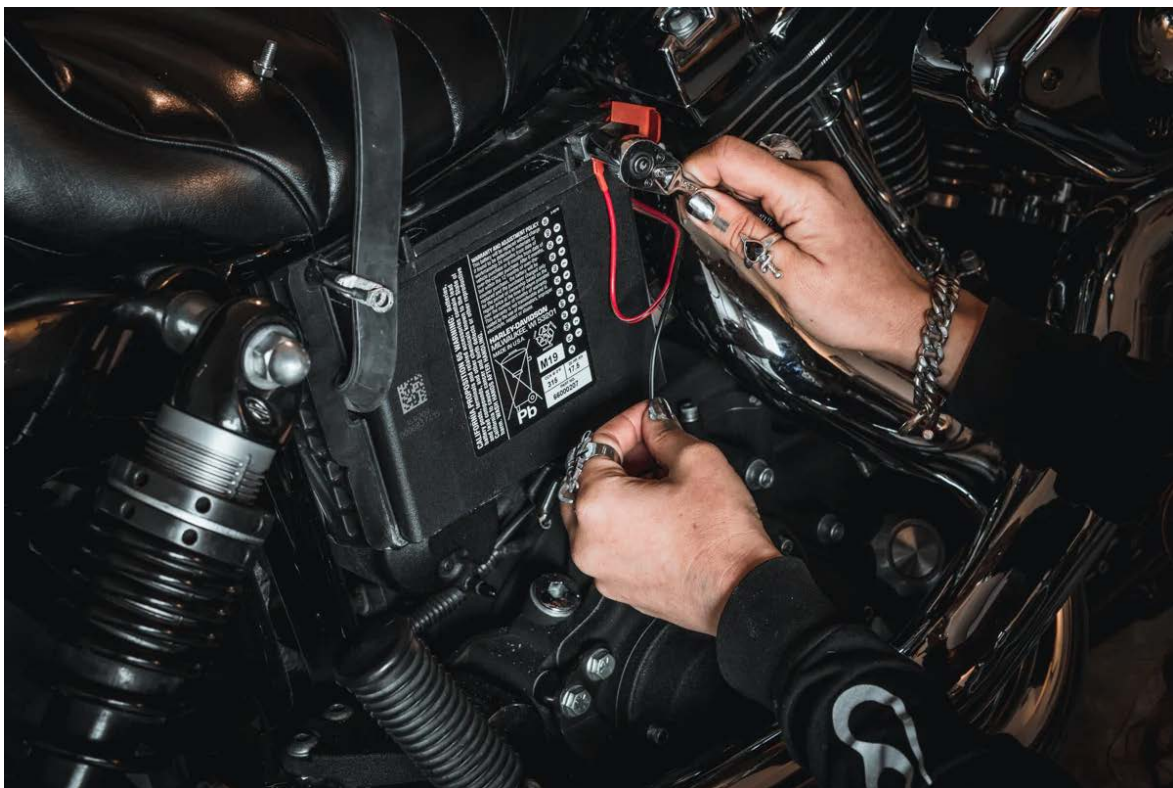


3.2 INSTALLATION & CONNECTION:

How To Install A Battery To Your Motorcycle.

Before beginning: Ensure the motorcycle & electrics are switched to the off position and the battery is fully charged before installation.

1. Place the battery in the battery tray and install the battery strap.
2. Fasten the **RED (+)** cable terminal onto the **POSITIVE (+)** battery terminal.
3. Place the rubber boot over the **positive** battery terminal.
4. Fasten the **BLACK (-)** cable terminal onto the **NEGATIVE (-)** battery terminal.
5. Apply a light coat of petroleum jelly or corrosion retardant material to both battery terminals.



PICTURED ABOVE: Note that she's used the rubber battery strap as a wedge to stop the black (-) leads touching the terminals whilst installing the battery

WARNING: Do not over-tighten bolts on battery terminals as that could result in damage to battery terminals. Use recommended torque values listed in your service manual.

Always connect the **red (+)** battery cable first! Connecting the battery in the reverse order can cause dangerous sparks which could result in battery, motorcycle or human injury.

3.3 VOLTMETER TEST

How To Diagnose A Battery's State Of Charge (Life).

The voltmeter test provides a general indicator of battery condition with a multimeter reader.

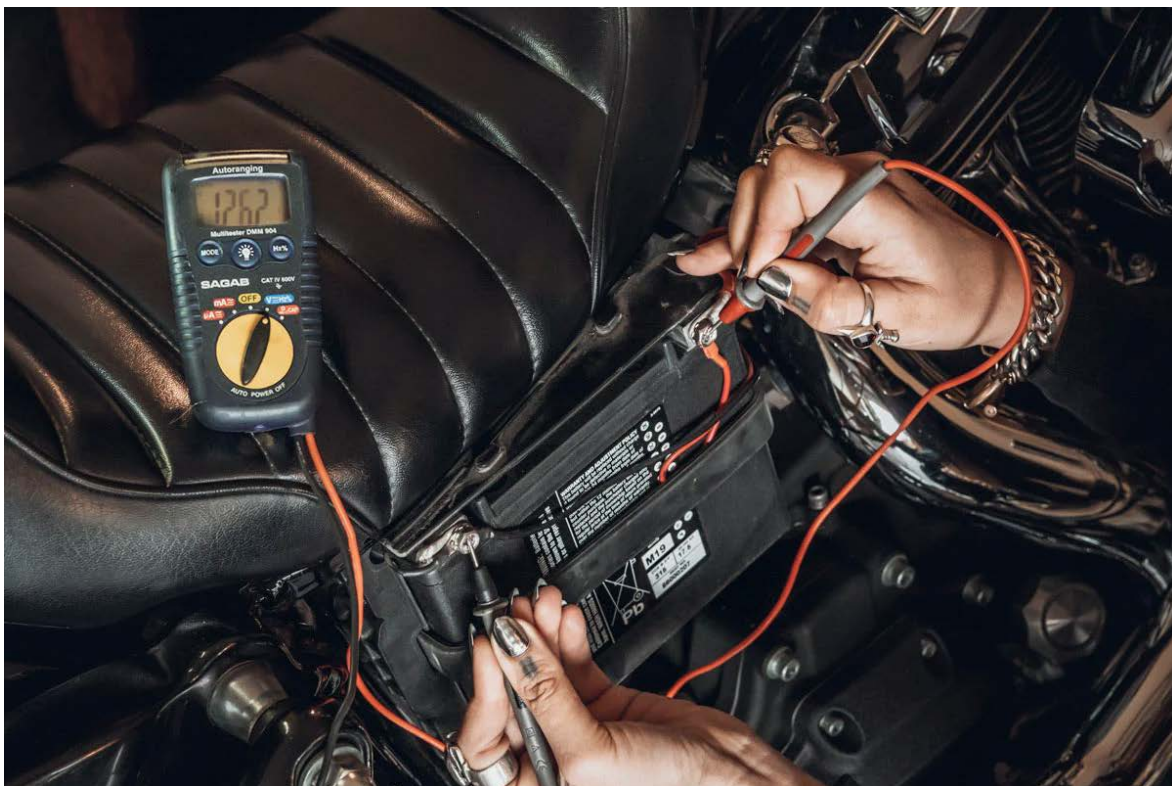
If you don't have a multimeter you can purchase one from your local tool or auto store, alternatively you can remove the battery and take it to a battery store to get tested.

TIP: It's best to perform this test around 30-45 mins after taking your bike for a ride or having a tender (or charger) installed. If the voltage reading is below 12.6V, charge the battery and then recheck the voltage after the battery has set for one to two hours.

HOW TEST A BATTERY'S CHARGE USING A MULTIMETER:

1. Set your multimeter to DC 20 Volts (or set to V for auto ranging multimeters).
2. Place the **RED (+)** multimeter prong onto the **POSITIVE (+)** battery terminal.
3. Place the **BLACK (-)** multimeter prong onto the **NEGATIVE (-)** battery terminal.
4. Check the voltage reading on the multimeter screen and refer to the table below.

VOLTAGE	STATE OF CHARGE	RIDE STATUS
12.7 v	100%	Ride On!
12.6 v	75%	Charge up, then jump on.
12.3 v	50%	Charge then ride. Start saving for a new battery.
12.0 v	25%	Pray to the moto gods, charge it, try your luck.
11.8 v	0%	Your battery is a paper weight & your bike is a pretty ornament.



If your battery is in good condition and holding a charge, the multimeter should read somewhere around 12.6 volts. Anything lower than 12.4 shortly after a full charge may indicate it's time for a new battery.

3.4 CHARGING BATTERY

How To Charge A Battery With A Traditional “Float” Charger.

This chapter refers to charging the battery using a traditional (constant current) charger, NOT, a smart [battery tender](#). (See table below for clarification)

SAFETY FIRST!

- Never charge a battery without first reviewing the instructions for the charger being used.
- Always wear eye, face and hand protection.
- Always charge batteries in a well-ventilated area.
- Turn the charger off before connecting the leads to the battery.
- Never try to charge a visibly damaged or frozen battery.
- Make sure that the charger leads to the battery are not separated, frayed or loose.
- If the battery gets hotter than 43° C (110° F) during charging, discontinue the charger and allow the battery to cool.
- Always turn the charger off before removing charger leads from the battery.

BEFORE THE CHARGE:

Charge the battery if any of the following conditions exist:

- Motorcycle lights appear dim.
- Electric starter sounds weak.
- Battery has not been used for an extended period of time.
- Voltmeter test results were below 12.6v

CHARGING THE BATTERY:

1. Perform a voltmeter test to determine the state of charge. ([Section 3.2: Checking the Voltage](#)). If the battery needs to be charged, proceed to the next step.
2. Clip the **RED (+)** charger lead onto the **POSITIVE (+)** battery terminal.
3. Clip the **BLACK (-)** charger lead onto the **NEGATIVE (-)** battery terminal, OR, If the battery is still connected in your motorcycle; Clip the **BLACK (-)** charger lead onto the bike's chassis, ideally away from the battery.
4. Step away from the battery & turn on the charger. **Refer to your service manual or charger instructions to see the approximate battery charging rates/times**
5. After the battery is fully charged, turn the charger OFF then disconnect the **BLACK (-)** lead.
6. Disconnect the **RED (+)** lead.
7. Mark the date on the battery to keep track of your charging requirements (*optional*).

WARNING: The use of constant current chargers should be a last resort as any overcharge will cause dry-out and premature battery failure. Smart chargers are a great alternative as they won't overcharge. If a constant current charger is the only type available, do **not** exceed the charge times listed in your service manual and do **not** continue charging the battery if it gets hot. When charging, never exceed 15 volts for more than 30 minutes.

BATTERY CHARGERS VS. BATTERY TENDERS

Battery chargers (float or constant current chargers) are generally used when a battery has gone flat, once connected to the battery it will supply constant power to the battery until it's been disconnected or switched off.

A battery tender (aka battery maintainer) is a smart charger that will automatically detect when to apply charge and when to stop, making them ideal for long term or unsupervised use.

See section [1.4 TENDER LOVE & CARE](#) for more info.

NOTE: *Some chargers and tenders can be referred to as TRICKLE CHARGERS, be sure to check the function of the charger before purchasing to avoid misuse and damage to your battery.*

3.5 STORAGE.

How To Maintain A Battery When It's Not In Use.

Planning a little moto hiatus? No judgement, we're just here to help!

The most important thing to remember when storing a motorcycle or battery for an extended period of time is to never allow the battery charge to drop below 12.4 volts or completely discharge. The more discharged a battery is, the more easily its electrolytes can freeze and crack the battery case.

- Install a battery tender (or maintainer) to ensure the battery is always receiving charge when needed. This can be done when the battery is removed or installed on the motorcycle **(RECOMMENDED)**.
- Always store in a cool (but not freezing), dry location. Batteries discharge at a faster rate with higher room temperatures.
- If a battery tender is unavailable, remove the battery from the motorcycle and fully charge it. Then every three to six months charge it again, ensuring the state of charge is always sitting at 12.4 volts or above.



PART 4. TROUBLESHOOTING

Why won't my motorcycle won't start?

4.1 BASICS CHECKLIST.

How to diagnose a flat battery.

When a bike won't start, most of the time you can blame it on a flat battery. However this checklist can help you eliminate a few other simple causes, particularly when the engine won't turn over.

If none of the below works then it's time to do a [voltmeter test](#) or [charge the battery](#).

- **Killswitch.**

Whether you use the killswitch or not, check that it's flicked off. Either you just forgot, you accidentally knocked it or maybe your mate played a prank on you?
- **Kickstand.**

Make sure your kickstand is UP. Most newer bikes, and some later models, have sensors to stop the ignition from starting when the kickstand is down.
- **Neutral // Clutch Engaged.**

Try starting your bike in neutral and with the clutch pulled in. Some bikes have safety sensors to prevent the bike from accidentally starting the bike when it's in gear.
- **Fuel.**

Open up & take a look, if you're running on empty, fill 'er up!
If applicable, make sure the fuel valve is set to 'ON'.
- **Choke.**

Carbureted bikes can struggle to start in the cold.
Turn the choke ON to start up; *this "chokes" the airflow through the carb, allowing more fuel to enter the engine to favour a cold start.* Let the bike idle for a few minutes, gradually turn the choke all the way off as the bike warms up, then saddle up and enjoy your ride!
- **Fuses.**

If your bike sounds as normal when starting but just forever clicks, the culprit could be a blown fuse. Locate your fuse box and replace any fuses that are blown. Keep in mind this usually happens when there is an issue with your wiring and may need further investigating.
- **Battery terminals.**

Your battery could be perfectly fine but not connected securely, visually inspect the battery for defects or loose connections. ([2.1 Battery Inspection](#)).

PART 5. JUMP-STARTING

Four different ways you can jump-start your motorcycle.

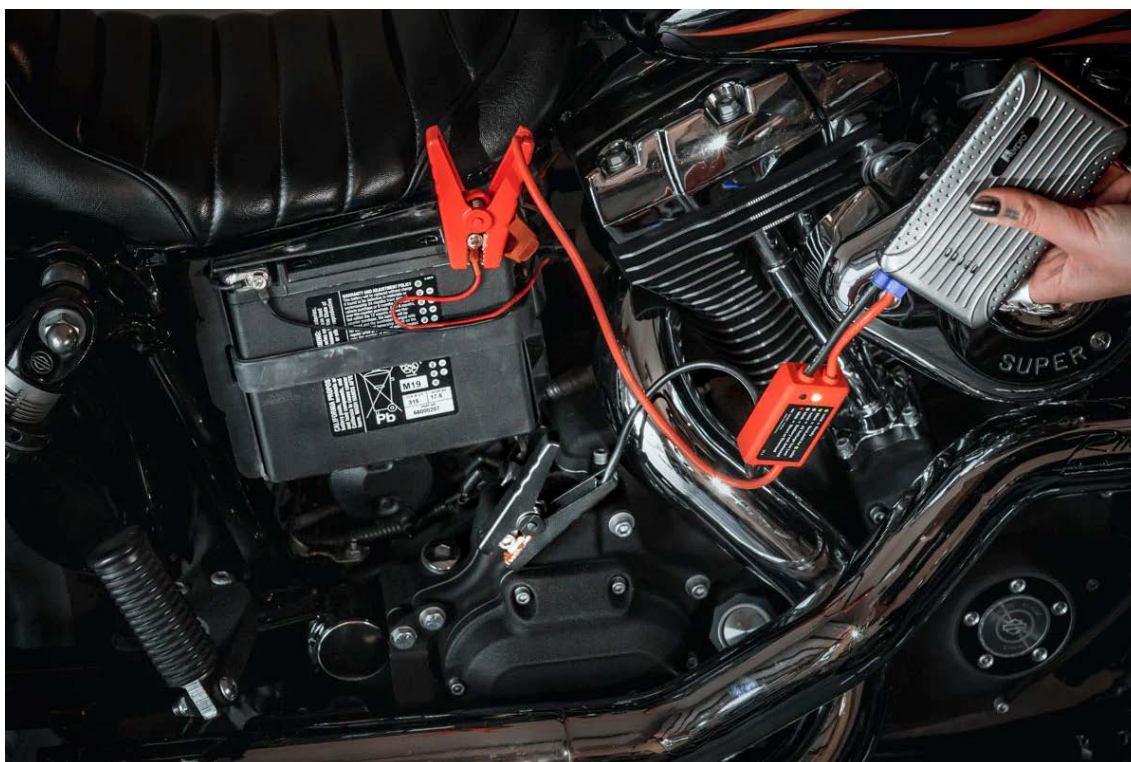
Caught out with a flat battery with no access to a charger? Here's a few ways to jump-start your motorbike. Keep in mind, once a battery's been fully discharged (flat) it is unlikely to hold its charge for long after. Once your bike is home, we recommend diagnosing why the battery went flat and if it needs replacing. ([Section 3.2 Voltmeter Test](#))

5.1 PORTABLE JUMP-STARTER

How to use a jump-starter pack on a motorcycle battery.

Portable jump-start packs are super convenient and compact power banks, usually pocket size. They include a set of little jumper leads and usually have a USB input so you can either charge your phone or jump-start a truck!

1. With the jump-start pack turned off, clip the **RED** lead onto your motorcycle's **POSITIVE (+)** battery terminal.
2. Clip the **BLACK** lead onto your motorcycle's **NEGATIVE (-)** battery terminal or chassis.
3. Turn the jump-starter on.
4. Start your bike. *(If your bike doesn't start the first attempt, wait a few minutes before trying again.)*
NOTE: Avoid holding down on the ignition button for longer than usual, this will drain the battery on the bike and also on the starter pack. If the bike won't start after a few attempts the battery may be dead and need replacing. (Refer to Section 3.3 for diagnosis)
5. Disconnect in the reverse order: **BLACK (-)** then **RED (+)**
6. Keep your motorcycle running for 15 mins or longer to recharge the battery, aka ride on!

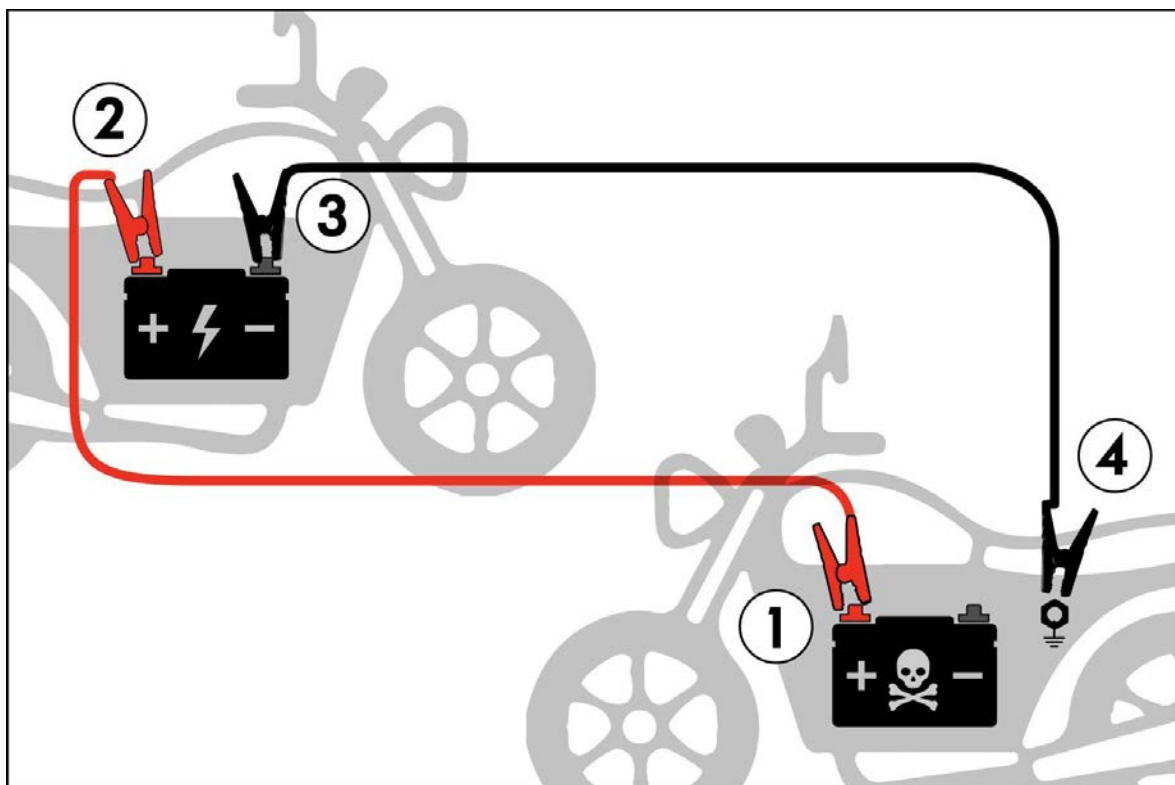


5.2 MOTORCYCLE TO MOTORCYCLE

How to jumpstart a motorcycle with another motorcycle.

Before beginning, make sure both bikes are switched off and are in neutral.

1. Just remember: "Red to Dead"
Clip the **RED** jumper lead onto the **POSITIVE (+)** battery terminal of your dead bike, then to the **POSITIVE (+)** battery terminal on the healthy bike.
NOTE: Make sure the black (-) jumper leads are not touching the chassis of either vehicle.
2. Clip the **BLACK** jumper lead onto the healthy bike's **NEGATIVE (-)** battery terminal, and the other end onto your bike's chassis (*any bare metal surface, away from your battery*).
This will avoid any possible sparks damaging the battery or electrical system.
3. Turn the working motorcycle on and let it run on idle for a couple of minutes.
4. Start your motorcycle (this may take a few attempts, but don't overdo it!) and keep both bikes running for a few minutes.
5. Whilst your bike is still running, disconnect the jumper leads in the reverse order you attached them: **BLACK (-)** then **RED (+)**.
6. Continue to leave your bike running, or go enjoy a ride, for at least 15 mins to recharge the battery.



5.3 CAR TO MOTORCYCLE

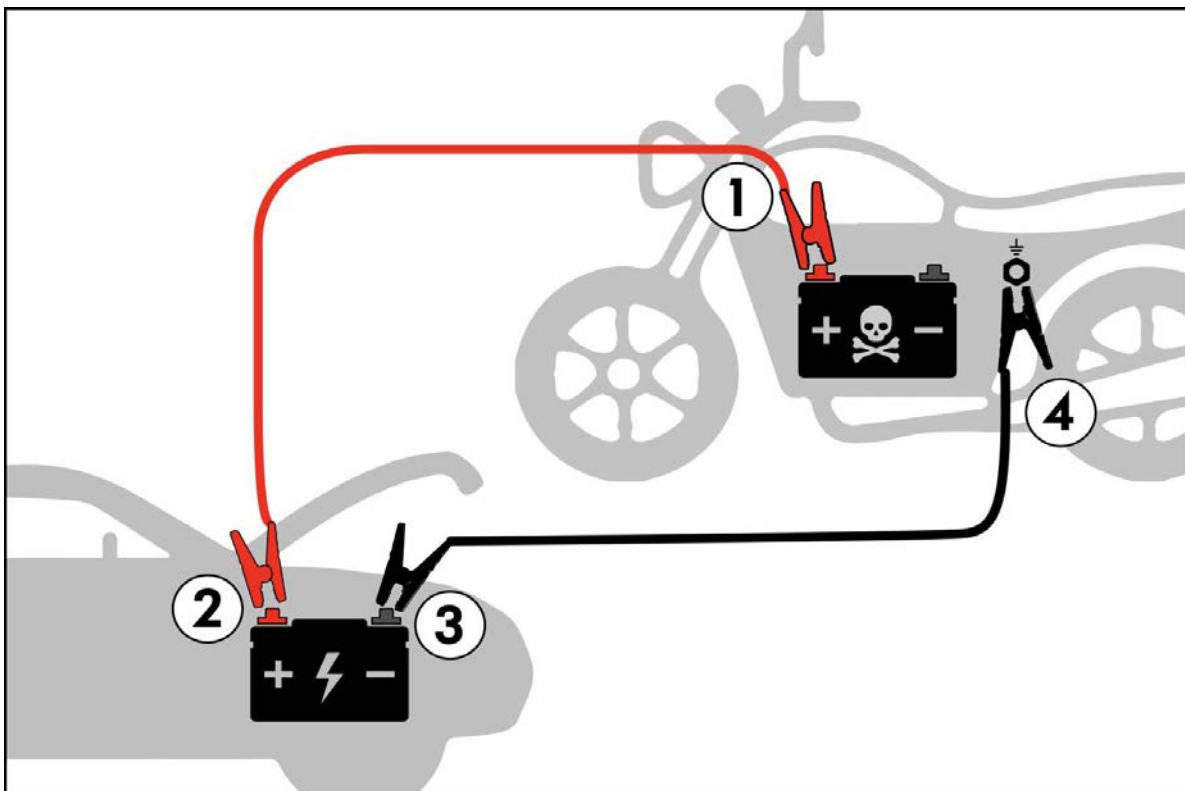
How to jump-start a motorcycle using a car. The safe way.

Car batteries have a much higher amperage than those in motorcycles, thus producing enough juice in their static state to get a flat motorcycle battery running. Turning the car on whilst jumping a motorcycle can easily overcharge your battery & most will likely f*ck sh!t up.

This method isn't ideal and may void your warranty, but if you gotta do what you gotta do, here's how to do it safely:

WARNING: Do NOT turn on the car during this jump-start process.

1. Remember: "Red to Dead"
Connect the **RED** jumper lead onto the bike's **POSITIVE (+)** battery terminal, then to the car's **POSITIVE (+)** battery terminal.
Make sure the black (-) jumper leads are not touching the chassis of either vehicle.
2. Connect the **BLACK** jumper lead onto the car's **NEGATIVE (-)** battery terminal, then the other end onto the bike's chassis (*grounded & unpainted metal surface, away from your battery*).
This will avoid any possible sparks damaging the battery or electrical system.
3. Start your bike.
4. Whilst your bike's still running, disconnect the jumper leads in the reverse order you attached them: **BLACK (-)** then **RED (+)**.
5. Keep your motorcycle running for 15 mins or longer to recharge the battery. In other words: go enjoy a ride!



5.4 PUSH-STARTING A MOTORCYCLE

How to jump-start a motorcycle without jumper cables or a battery. The analog way.

Push-starting (aka bump-starting or pop-starting), is for when you have no access to jump-start or charge your battery and a tow truck is out of the question, **it's for when you're up ship creek without a battery paddle.**

This method may or may not work depending on your bike and the battery's state of charge. Most newer motorcycles with fuel injection can be challenging and will need at least 9V of charge in the battery to get the full electrical system started.

If your battery is dead as a doornail then push starting your bike is going to give you nothing but a pointless workout. If you can hear the fuel pump turn on (EFI bikes) or you're able to see a glow from the headlight & instrument lights when the key is turned on, then there might actually be a light at the end of the tunnel.

Before beginning check the troubleshooting checklist! Imagine doing all this physical exercise only to realise you just needed to put more petrol in the tank, or flick the killswitch.

1. **Location & Prep.**

Ideally you'll want a hill to roll down and a buddy to push to push you, if not get physically & mentally prepared to put the legwork in.

Once you have a clear runway make sure the killswitch is off and the key ignition is on.

2. **Gear Up.**

We're not just talking about slapping your brain bucket on, pop your bike into 2nd gear to avoid any unwanted jerking whilst pop starting your bike.

3. **Run Like The Wind.**

With your clutch fully engaged, push your bike to get as much momentum as possible. It's recommended to have the speed of at least 8 km/h (5 mph) for a successful push start.

4. **Pop it Like it's Hot.**

Once you're at optimal speed, pop the clutch! This should create enough compression to start your motorcycle.

Popping, or dumping, the clutch means to let go of the clutch quickly instead of easing the clutch lever out.

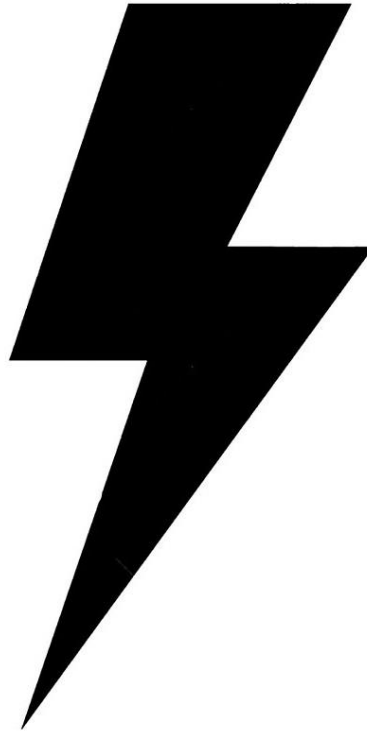
5. **Ride!**

You may need to rev the bike a bit once you have it started. Ride to your destination and get that battery looked at immediately!

We do not recommend going for a cruise right now, running on a flat battery can cause damage to your charging system.

Thanks for reading our Battery Maintenance User Manual!

Visit our website www.motoest.com.au to view our range of motorcycle gear or find more helpful tips on our [User Manual page](#).



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