

cangoee  
power

# 300 Series Toyota Landcruiser Installation Manual

INS0185



off-grid / on-grid / on-demand.

# Contents

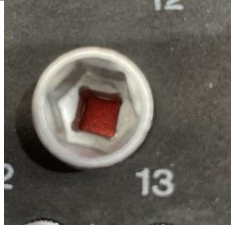



Overview.....	2
Tools.....	2
What’s in The Kit.....	3
Installation Overview.....	4
WARNINGS and SAFETY.....	5
Stage 1.1 – Remove Boot Space Panels.....	6
Stage 1.2 – Remove Side False Floor Panels.....	7
Stage 1.3 – Remove Rear Plastic Covers.....	8
Stage 1.4 – Remove Boot Space Side Panel & OEM Jack.....	9
Selector Switch Settings/ DCDC Charger.....	9
Selection Modes.....	10
Mounting Locations/ General Dimensions BATR – For stage 2.....	10
Vehicle Wiring Diagram – For stages 2–3.....	12
Stage 2.1 – Installing Battery System– Rear Install.....	13
Stage 2.2 – Install Battery System Wiring DC-DC.....	14
Stage 3.1 – Installing DC-DC and Ignition Sense.....	15
Stage 3.2 – Installing Midi Fuse and Connect to Vehicle Battery.....	16
Please Note.....	17
<b>Congratulations!</b> .....	17
Battery Management System.....	18
Safety Tips.....	18
Longevity Tips.....	18
Tips for Use.....	19
Maintenance Tips.....	19

# Overview






The following guide is designed to assist with the install by providing a quick and easy guide for installation of this battery kit into the 300 Series Toyota Land Cruiser.

Cangoee strongly recommends following this guide and urges that the installers are qualified professionals.

## Tools

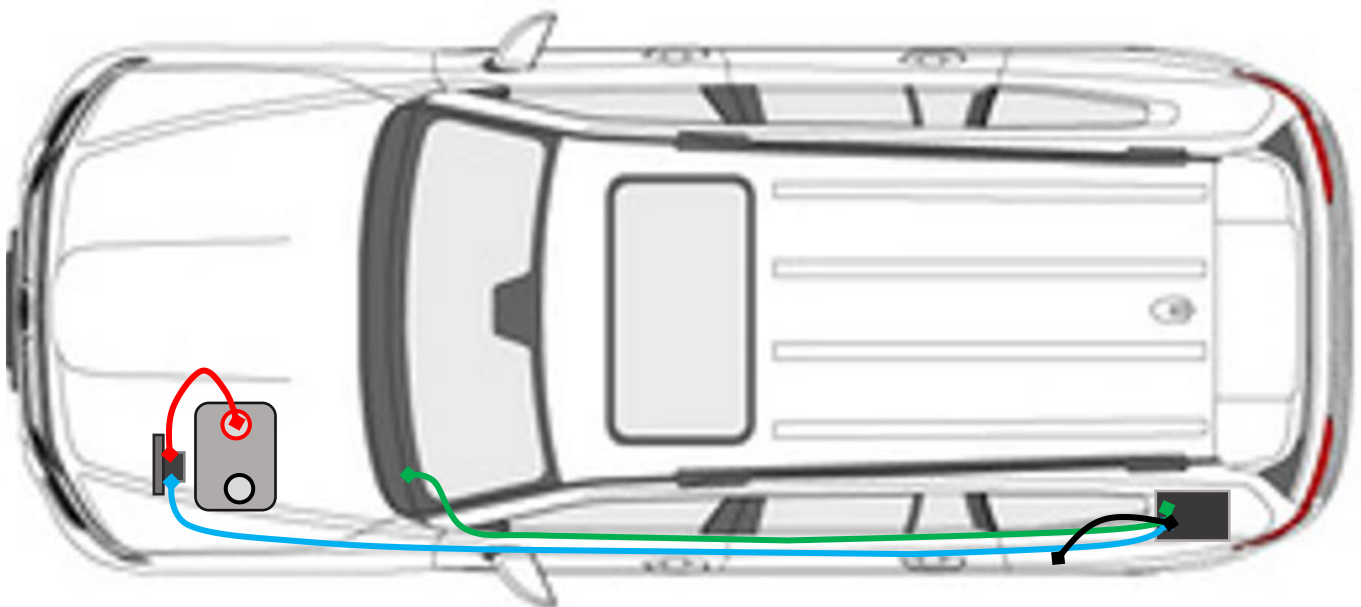
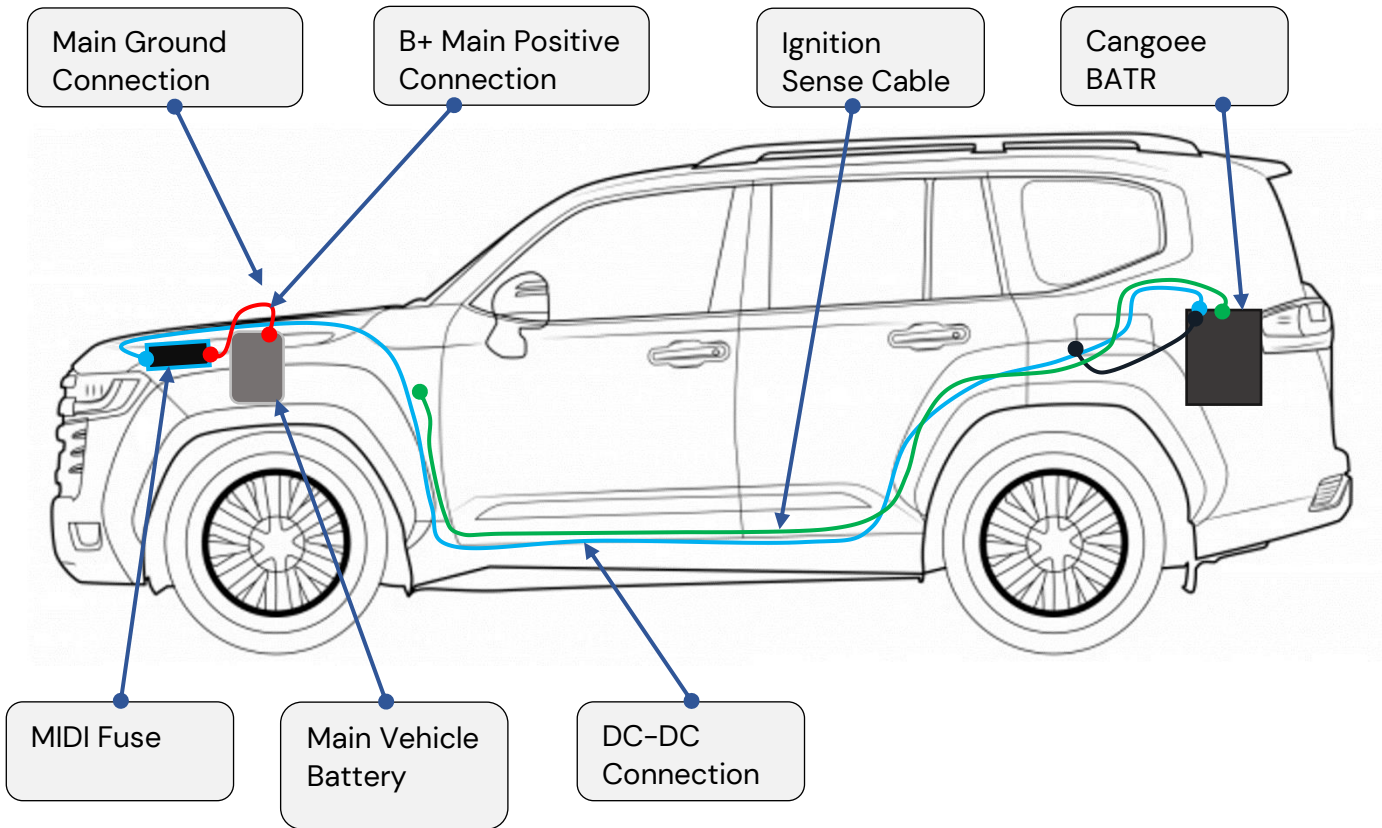
Tool	Description	Visual
13mm Socket	13mm Ratchet Socket to remove Hex Head Screws/ Bolts	
12mm Socket	12mm Ratchet Socket to remove Hex Head Screws/ Bolts	
10mm Socket	10mm Ratchet Socket to remove Hex Head Screws/ Bolts	
8mm Socket	8mm Ratchet Socket to remove Hex Head Screws/ Bolts	

# What's in The Kit

Tool	Description	Visual
CANGOEE Y62 Battery System	The battery system for install	
DC – DC Charge Cable	DC-DC long twin core cable with black outer insulation: Red and Black Connections	
Ignition Sense – Fuse Tap Cable	Used for the Ignition Sense function: Black braided with fuse clip on end	
Midi Fuse on Bracket	Midi Fuse attached to bolt-on bracket	
Main Positive Battery Connection (B+)	Cable connection for Midi Fuse	

Please ensure proper care is taken when handling these parts as there are no spares included in this kit.

# Installation Overview



Top view of installation: with DCDC cable (**Blue**), Ignition Sense Cable (**Green**) and Main B+ Cable (**Red**).

# WARNINGS and SAFETY

## SAFETY!

The battery contains lithium iron phosphate (LiFePO<sub>4</sub>) cells, considered to be the safest of all lithium-ion chemistries. The battery contains a large amount of stored energy. **Please follow these quick tips for safe use and operation:**

- Ensure appropriate PPE gear is worn at all times during this install
- Ensure the battery is secured safely before travel.
- Do not drill into the enclosure. Doing so may inadvertently puncture one of the internal cells.
- Do not short circuit the battery. Be careful not to drop a metallic object across the two exposed terminals. Always keep the terminal caps on the POS and NEG posts during operation.
- Do not mount the battery upside down. The battery can also be mounted on its side if mounting upright is not an option.
- Do not connect multiple batteries in series to raise the voltage. The Battery Management System (BMS) is not designed to accommodate higher voltages.
- If the battery comes in contact with your skin, please immediately seek medical advice.

### Please Note:

Cangoee strongly recommends that a competent person completes this install, however if installing at home or by yourself, please adhere to the instructions and follow all steps carefully.

This is to ensure your Cangoee battery System is properly installed, and functions as intended.

**Please Make Sure** proper PPE equipment is always used, and the vehicle has been turned off to avoid serious injuries or damage to your vehicle.

## WARNINGS!

**Please follow** these warnings carefully and adhere to the 'safety' Guidelines when installing this battery system:

- Avoid mechanical shock
- Do not expose battery to fire
- Do not pierce battery
- Do not disassemble
- Do not drill into enclosure
- Do not short battery terminals
- Do not charge battery below 0 °C
- Do not store below -20 °C or above 60 °C
- Risk of burns if misused
- Always follow safe working practices
- Installation of this device should only be carried out by appropriately qualified competent persons.
- All minimum cable gauges and maximum lengths must be followed.

## WARNING

This install works with live wires and electricity, ensure all safety guidelines are followed and proper equipment is used during this Install. Failing to follow these guidelines could result in incorrect installation of the Cangoee battery, malfunction, or severe injury.

## Stage 1.1 – Remove Boot Space Panels



1. Fold back row chairs back down to floor level
2. Remove side panels on plastic wall



## Stage 1.2 – Remove Side False Floor Panels



1. Remove side bottom panels on both sides by tacking of plastic clip and unscrewing Phillips head
2. Remove rear plastic bumper by prying off carefully.
3. Fold over and remove rear false floor





## Stage 1.3 – Remove Rear Plastic Covers



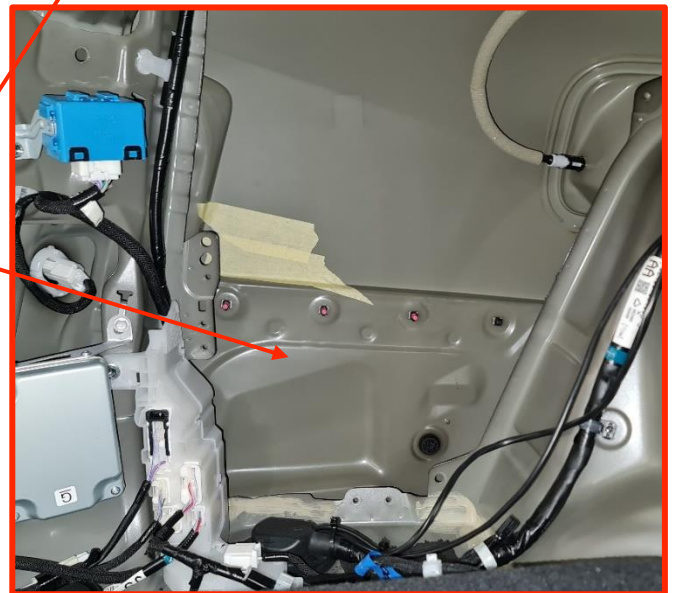
1. Take off plastic covering from rear folded seats, this panel can be pried off
2. Pry off rear cup holder on side plastic panel to make removal of side panel easier – ensure proper care is taken when removing panel as small clips may break if pulled too hard



## Stage 1.4 – Remove Boot Space Side Panel & OEM Jack



1. Carefully remove side plastic panel – this can be done by releasing the clips internally and working slowly from left to right and top to bottom to pull away panel. Ensure care is taken when removing panel as clips may break if pulled with too much force
2. Unscrew OEM jack and place to side for later reinstallation.



Stage 1  
Complete

# Selector Switch Settings/ DCDC Charger

The DC-DC charger in the CAN battery allows the battery to charge from a vehicle engine/alternator/start battery. However, to avoid draining the start battery, charging is only desired while the engine is running.

In some applications it can be difficult to determine when the engine is running. Therefore, the DC-DC charger reads several inputs to determine when to turn ON (charge) and turn OFF (stop charging) to achieve:

- Charging when the engine is running, to maximize charging of the Cangoee Battery
- Not charging when the engine is not running, to avoid discharging the vehicle start/cranking battery.

Logic to determine when to turn the DC-DC charger ON and OFF will be implemented using software running on a microcontroller to allow advanced control combining several inputs:

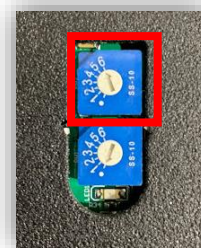
- Start battery voltage
- Ignition signal voltage
- Timing delays
- 2 x 7-position (0-6) rotary switches: user-accessible from outside the battery

Carefully view the below tables to understand the different Selection Modes.

## Selection Modes.

Delay Switch Position	Delay Off Time	Application
0	0 Sec	Trad Alt, or Ignition Relay
1	30 Sec	Smart Alternator
2	1 Min	Smart Alternator
3	1.5 Min	Smart Alternator
4	3 Min	Smart Alternator
5	3.5 Min	Smart Alternator
6	0 Sec	Ignition Signal Control

OFF  
DELAY



Voltage Switch Position	On Level	Off Level	Application
0	11	10	Always On: Ignition Relay/ Signal
1	12	11	Very Long, Thin Cable
2	13	12	Long, Thin Cable
3	13.3	12.3	Long Cable
4	13.5	12.5	Smart Alternator
5	13.7	12.7	Traditional Alternator
6	14	13	Traditional Alternator

MEASURED  
VOLTAGE

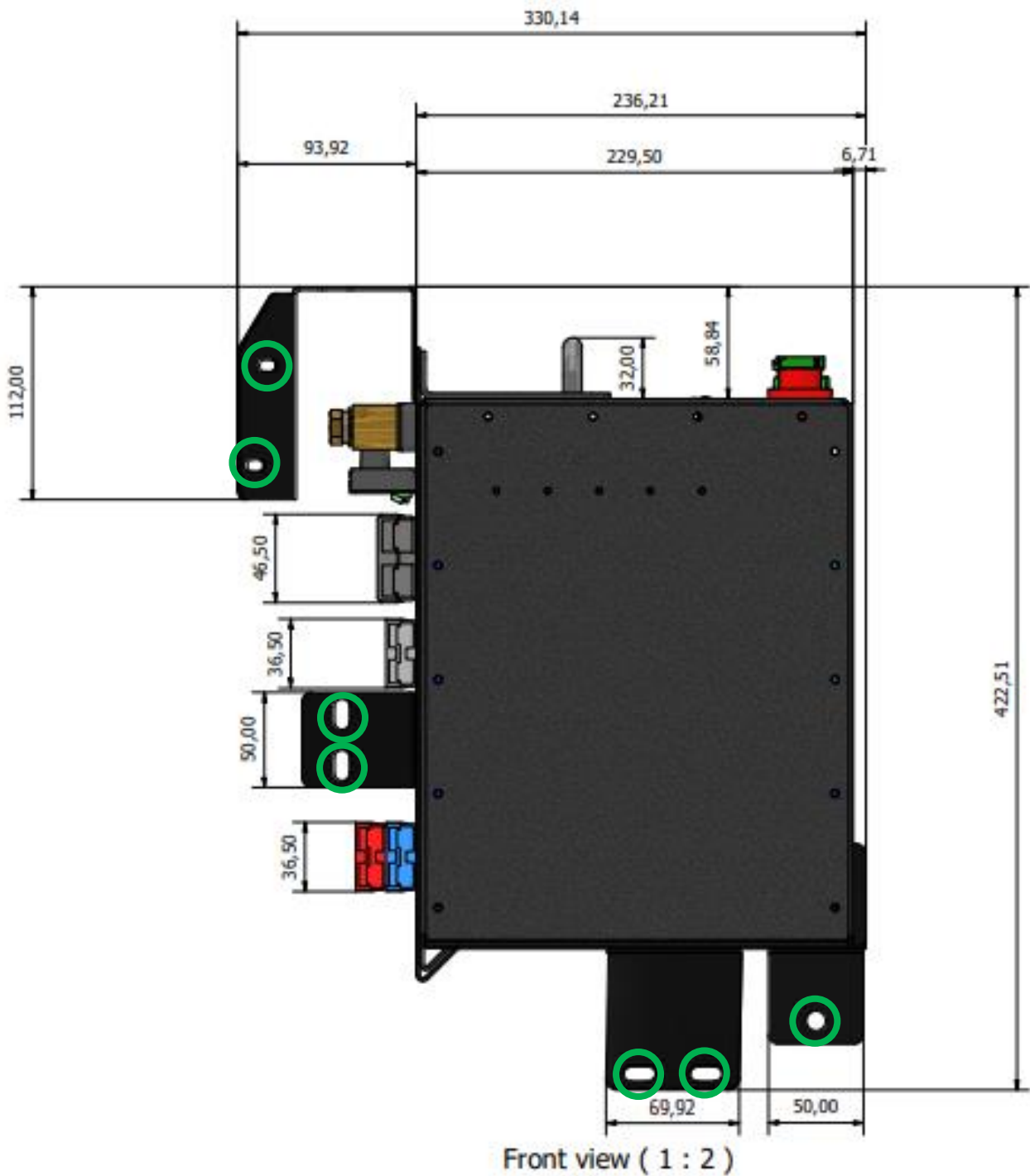


### ATTENTION

Please carefully view the different selection modes, as the switches are not easily accessible once installed.

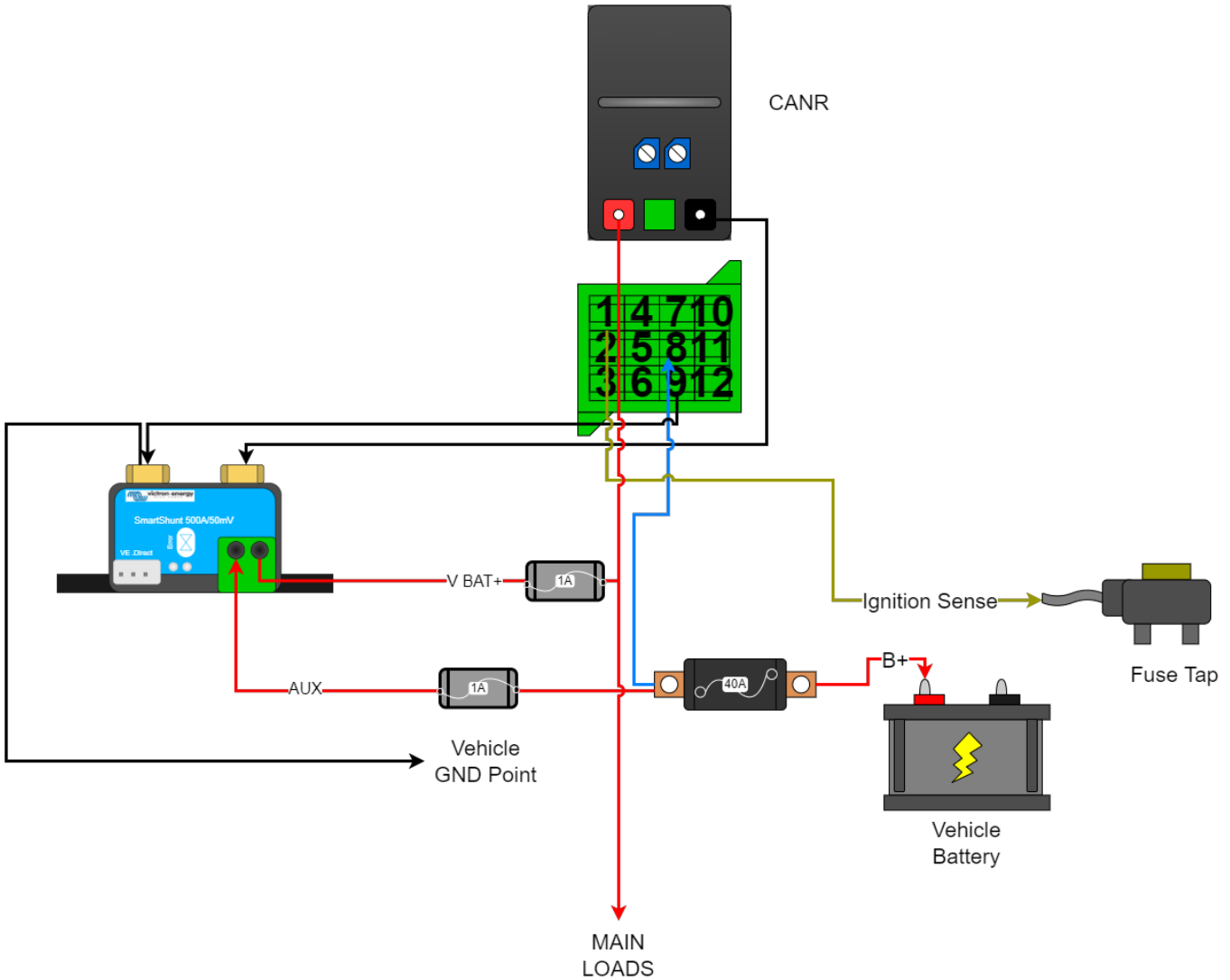
# Mounting Locations/ General Dimensions BATR – For stage 2

Please Carefully view the diagram for correct mounting points (Denoted in Green)

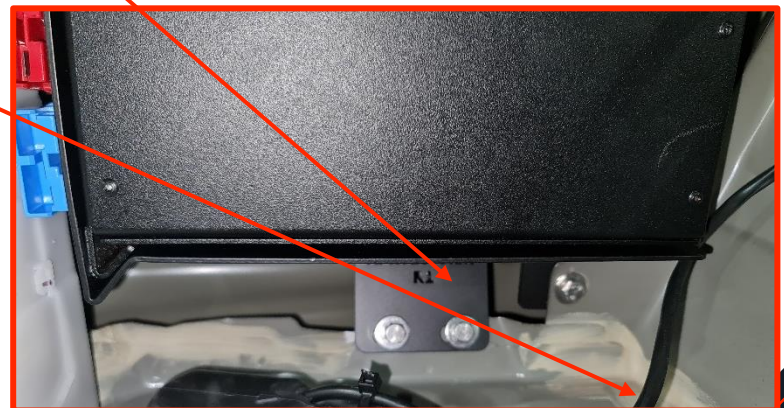


# Vehicle Wiring Diagram – For stages 2-3

Carefully view the wiring diagram below for best practice.

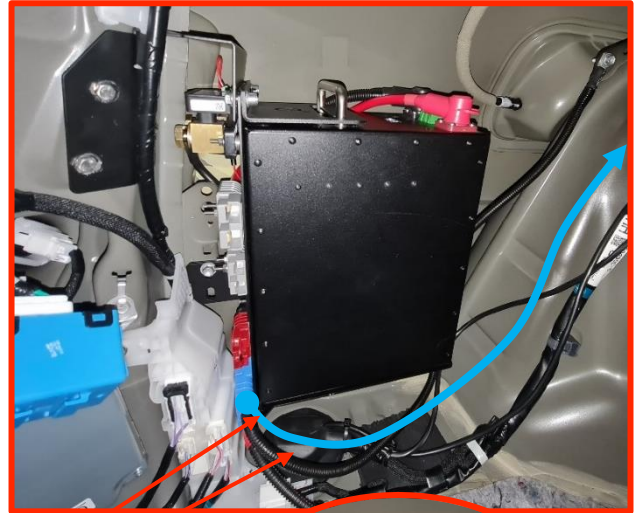


## Stage 2.1 – Installing Battery System- Rear Install



1. Disconnect the relay box from the side wall chassis – ensure that you do not damage or puncture any wires when removing as this could cause damage to your vehicle
2. Screw on mounting plates to side chassis on top and bottom top and bottom – please ensure these are tightened as the battery may come loose whilst the vehicle is in motion, which could cause severe damage to the CAN battery system
3. Bolt on battery and place wires to the side

## Stage 2.2 – Install Battery System Wiring DC-DC

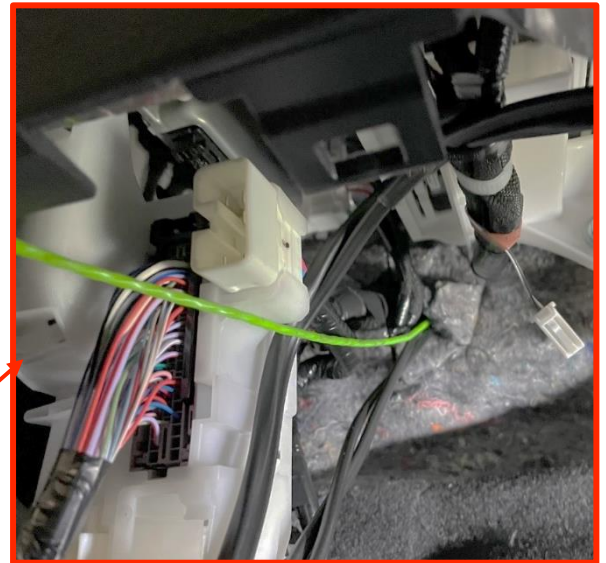
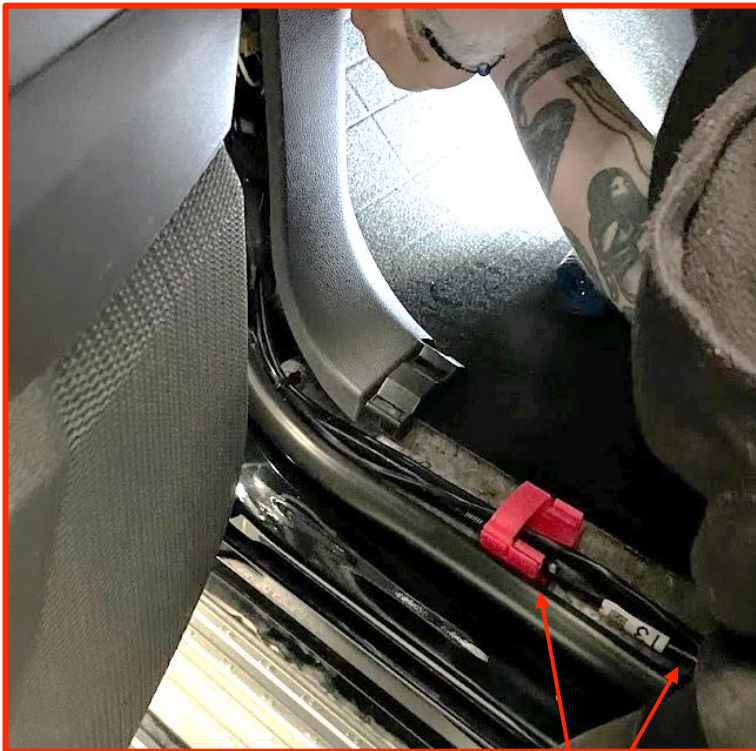


1. Connect DC-DC and Main Negative to blue Anderson plug, ensure that cables are zip tied or otherwise held in place
2. Connect main negative to chassis as shown and screw into place
3. Run ignition sense cable with DC-DC cable through the left hand side firewall and over wheel arch



Stage 2  
Complete

## Stage 3.1 – Installing DC-DC and Ignition Sense

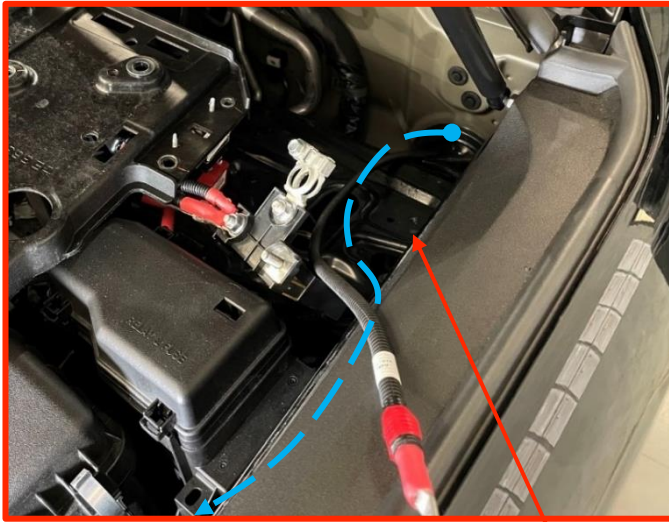


1. Run DC-DC and Ignition sense cable through passenger side firewall, zip tie cables to existing
2. Connect ignition sense to fuse tap
3. Run DC-DC through OEM engine bay grommet

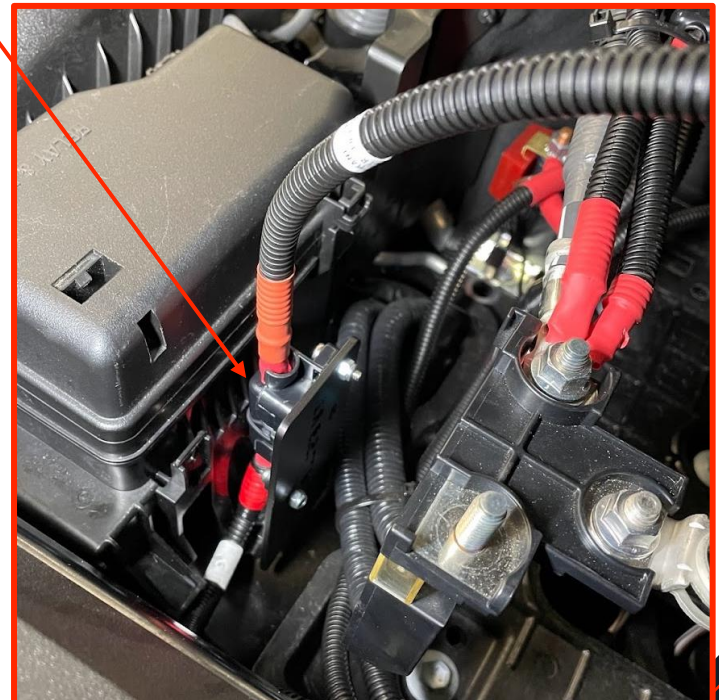
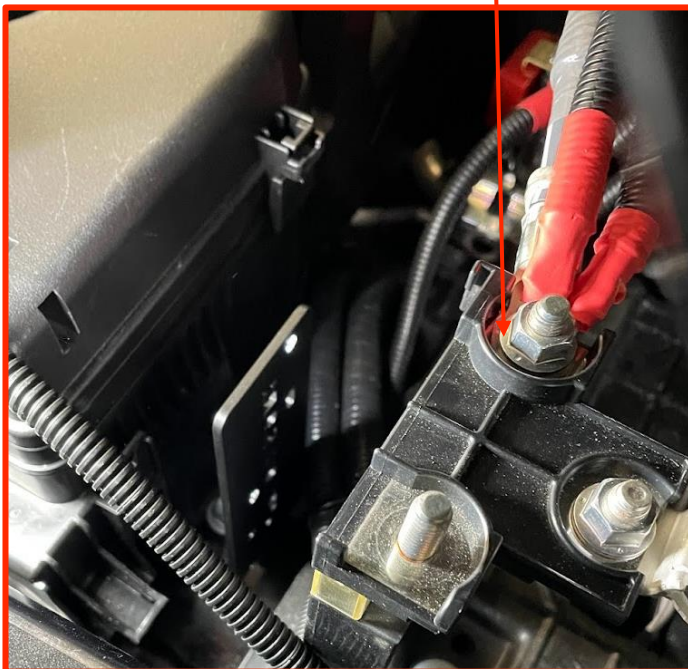
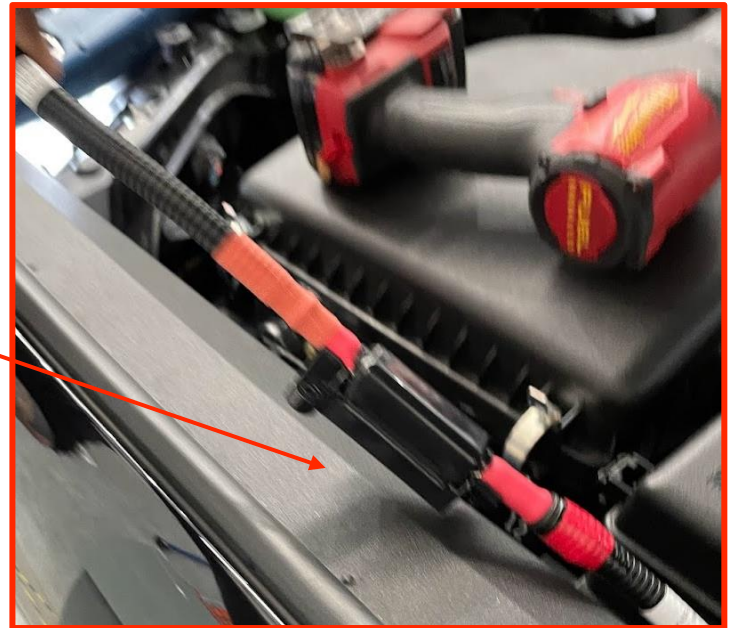




## Stage 3.2 – Installing Midi Fuse and Connect to Vehicle Battery



1. Connect DC-DC to Midi Fuse and attach Main B positive cable to adjacent end of Midi Fuse
2. Screw Midi Fuse bracket to side of relay box as shown
3. Run Main B+ Cable around to vehicle battery terminal.



Stage 3  
Complete

## Please Note

Cangoee strongly recommends that installers do not disassemble, rearrange or misplace components of the battery system as this could result in improper use, malfunction, or serious damage to the battery system.

Once again, we urge that installers where appropriate PPE gear when assembling and disassembling and that safety guidelines and warnings are adhered to.

**Please Make Sure** that vehicle is **turned off** whilst installing or uninstalling the battery system.

## WARNING

This install works with live wires and electricity, ensure all safety guidelines are followed and proper equipment is used during this Install. Failing to follow these guidelines could result in incorrect installation of the Cangoee battery, malfunction, or severe injury.

# Congratulations!

Your brand new Cangoee  
Battery System is installed



# Battery Management System

The BMS is an internally mounted electronic solid-state circuit board that manages the cells and protects the battery, including overcharge and over-discharge protection. The BMS protection mechanisms will also activate during low voltage at 10.5V, overcurrent at 100A, and short-circuit situations. Unlike lead-acid batteries, overcharging or over-discharging a lithium battery may lead to a hazardous scenario. Therefore, the BMS is essential to the lithium battery. The BMS ensures that the battery cells are equalized throughout its operation. The BMS off can be initiated by applying the batteries 12V to pin 12 on the 12 pin MCP, this is used for disconnecting remote loads and should only be used to isolate in place of a dedicated isolator.

## Safety Tips

The battery contains lithium iron phosphate (LiFePO<sub>4</sub>) cells, considered to be the safest of all lithium-ion chemistries. The battery consists of a large amount of stored energy. Please follow these safety tips for use and operation:

- ❑ Ensure the battery is secured safely before travel.
- ❑ Do not drill into the enclosure. Doing so may inadvertently puncture one of the internal cells.
- ❑ Do not short-circuit the battery. Be careful not to drop a metallic object across the two exposed terminals. Always keep the terminal caps on the POS and NEG posts during operation.
- ❑ Do not mount the battery upside down. The configuration of the battery is different for the BA and BA2 models, with each shown on Page (5, 6). The battery can also be mounted on its side if mounting upright is not an option.
- ❑ Do not connect multiple batteries in series to raise the voltage. The BMS is not designed to accommodate higher voltages.
- ❑ If the battery is in contact with the skin, please immediately seek medical advice.

## Longevity Tips

Factors that mainly affect the lifespan of the battery are depth of discharge and operating temperature. To ensure longevity and use of the battery:

- ❑ Do not fully discharge the battery to zero. Each time the battery is discharged to zero, either intentionally or unintentionally, reduces the lifespan of the battery.
- ❑ Do not discharge the battery below 80% depth of discharge (i.e., 20% full).
- ❑ Do not charge the battery outside the range 0°C – 45°C to maximize the life of the battery and avoid damage to the cells.
- ❑ Do not operate the battery in direct sunlight, mount the battery in a compartment or undercover

The cells are designed to last 2,000 cycles at 80% DOD (Depth of Discharge) and 5,000 cycles at 50% DOD.

## Tips for Use

- ❑ Batteries of the same voltage may be placed in parallel to increase storage capacity. However, each battery should be independently fused, and the battery must be from **CANGOEE**.
- ❑ If the battery is frozen it is essential to wait for the battery to be defrosted and wait for an appropriate room temperature before connecting power to the battery.
- ❑ The battery is splash-proof and water-resistant but not waterproof, **DO NOT** directly submerge the battery in water.
- ❑ The battery is designed to be housed in a dry, enclosed compartment, not in direct sunlight or exposed to outside weather conditions for an extended period.

## Maintenance Tips

If not using the battery for a prolonged period (months at a time), then store the battery as follows:

- ❑ Disconnect all loads from the battery as there is no external current draw.
- ❑ Store the battery close to full capacity (the battery does not need to be at 100%).
- ❑ There is no need to keep the battery on trickle charge. The battery will self-discharge over time slowly.
- ❑ Within every two months, give the battery a quick recharge to ensure battery longevity