

X-Eng is a division of  
Foundry 4x4 Limited  
The Old Bakery,  
Rear of Vale Terrace,  
Tredegar, Gwent. NP22 4HT

## X-Charge Fitting Instructions

Thank you for choosing to buy an X-Charge!

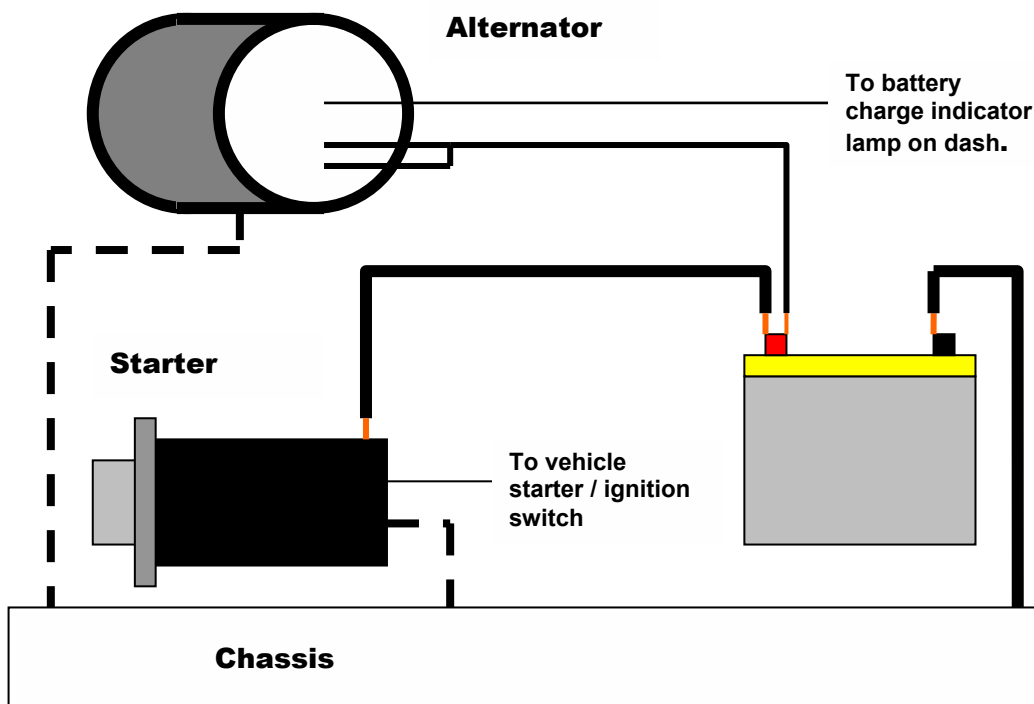
**Vehicle newer than 1995 / Battery Sensed Alternator? See Note 1**

These instructions assume that you already have a pair of batteries fitted and that one of them is wired up as standard to be charged by the alternator and to power normal vehicle systems.

This battery will be known as the MAIN battery.

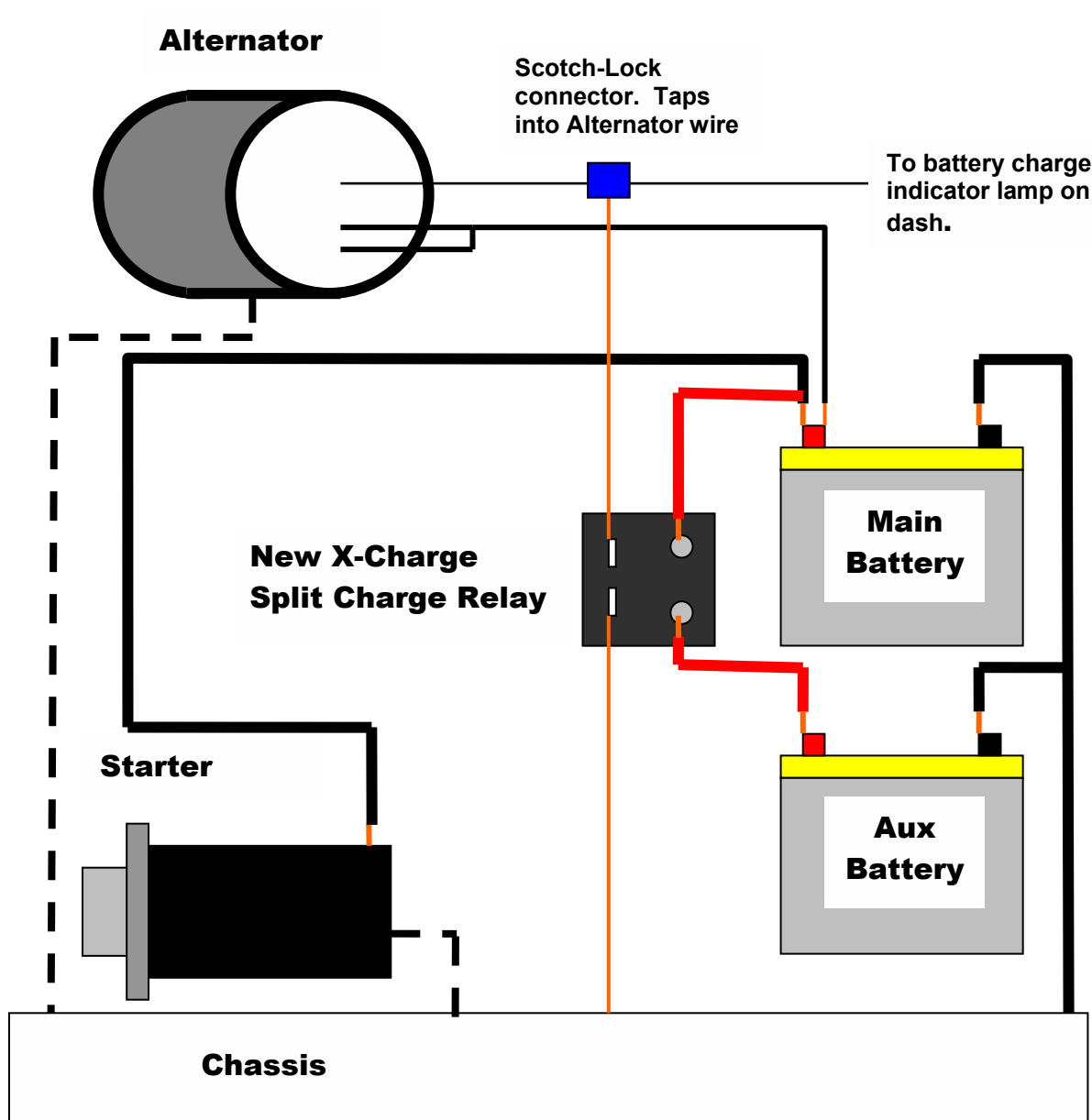
The second auxiliary battery which you have probably added to power your electric winch and/or other equipment will be known as the Aux Battery.

A normal vehicle is wired up something like this:



The chassis acts as an earth and provides a return path for the electricity to the battery negative terminal.

When you add a second battery, you should modify the wiring to something like this.



New wire colours are shown as supplied in the X-Charge kit.



The heavy red leads are used to connect the two stud terminals on the X-Charge Relay to the batteries. The leads are supplied with a ring connector on each end. The smaller ring attaches to the split charge relay.

You will need to secure the larger ring to your battery terminal. If necessary, remove the ring terminal and replace with something suitable for your battery. The ring terminal supplied will allow connection to most vehicles.



It does not matter which way round either the heavy red wires or the light orange wires connect to the X-Charge relay.

The length of light weight orange wire is used to connect the X-Charge Relay to the chassis / battery negative terminal and to the alternator charge indicator wire (see next section to identify this wire), via the blue 6.5mm female spade connectors supplied.

To make the connection to the alternator charge indicator wire simple, we have supplied an Insulation Displacement Connector (Often called a Scotch-Lock). These are often frowned upon in vehicle wiring as they can corrode over time weakening the electrical connection.

They are however quick and simple. They do not require special tools and can be added or removed without modifying the original vehicle wiring harness.



We have found they work very well in this situation and will have a long life, particularly if covered in petroleum jelly to limit the ingress of water.

# Fitting Instructions:

First you need to find somewhere to secure the X-Charge relay. We would recommend fixing it to the side of your battery box with a single screw through the fixing tab on top of the relay.

Make sure that the two heavy red leads supplied will reach from the relay in this location to each of the positive terminals of the two batteries. If not – consider a different location!

Attach the larger of the two ring terminals of each lead to the positive battery clamp, one on to each battery.

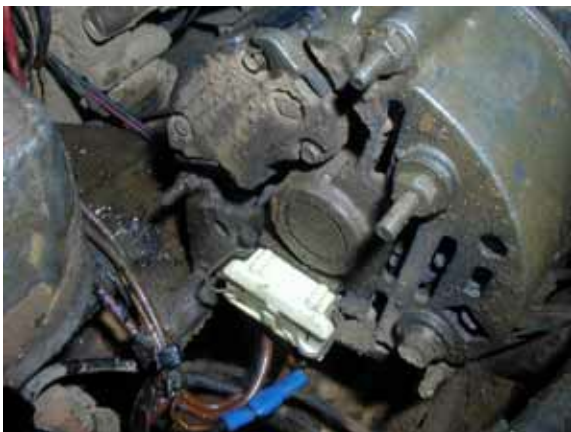
The photograph (Right) shows a 'Stud' type battery clamp. These allow multiple, heavy duty ring terminals to be connected very securely. They are available for a few quid from most motor factors.

Next connect the smaller ring terminal to the stud terminals which stick out of the relay. Tighten the nuts on the terminals to secure the leads in place.



Next we need to attach the orange wire to the alternator.

Most Alternators have three wires coming out the back. There will be two thick wires and one thin one, probably terminating in a single plug which is pushed into the back of the alternator.



In the photographs above, you can see two thick brown wires and a thinner brown wire with a yellow stripe.

We are interested in the thin wire. Attach the orange wire to the thin wire using the scotch-lock connector.



Slip the connector over the alternator wire (Black in this case).



Insert the orange wire into the hole on the other side as shown.



Use a pair of pliers to depress the metal spade into the body of the connector. This metal spade has blades which cut through the insulation of the wire making contact with the inner conductor.



Finally snap the lid shut to hold the spade in place.

Route the cable, keeping it away from hot or twisty-turny things to the battery box / location of the X-Charge relay.

Once the orange wire is secure, trim off the excess and crimp on one of the blue female spade terminals. Attach this to either of the male spade connectors on the relay.

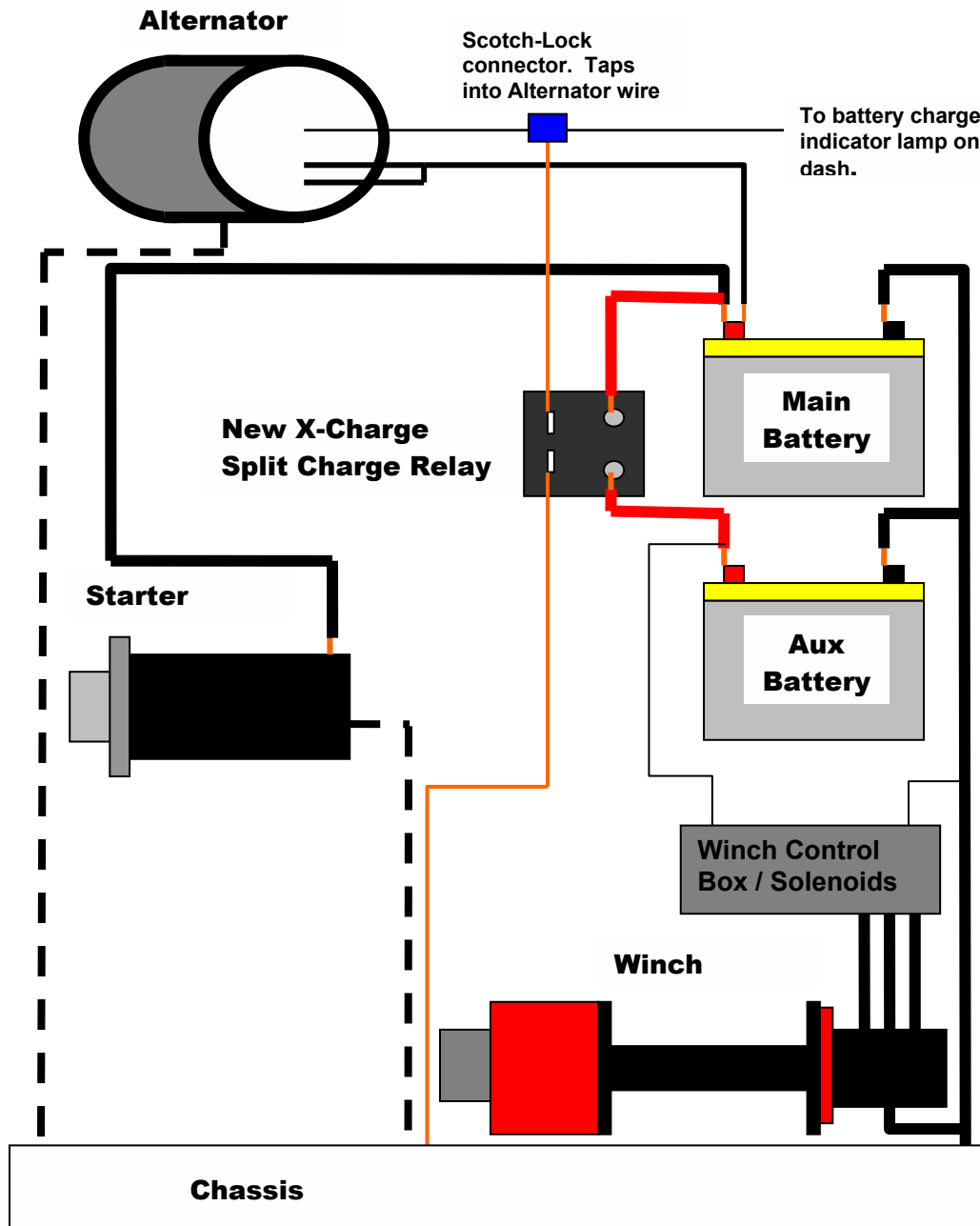
Using the excess orange wire, make a connection from the other spade terminal on the relay to a good earth (battery negative terminal / chassis / metal side of battery box). You could combine this connection with the screw which mounts the X-Charge relay in place.

Attach the X-Charge relay to its final mounting location.

Ensure the negative terminals of the two batteries are connected together with heavy duty cable.



Lastly, cover all the connections with petroleum jelly to protect them and you are finished!



We have encountered many people who have fitted a good quality winch, two batteries and a split charge unit such as this – and still complain that their winch could not pull the skin off a rice pudding!

The very first thing to check is the earth connection to the winch. Do not assume that there is a good connection from the winch body to the bumper / carrier and from that to the chassis and then from the chassis to the battery!

Each connection you add between the winch and the battery will reduce it's performance a little and give you another failure point.

Run a length of 25mm or 35mm wire from the earth terminal on the motor directly to the negative terminal of the winch battery. If your motor does not have an earth terminal, at the very least run the earth from one of the winch mounting bolts to the battery.

I guarantee this will improve performance! If the winch is still lacking – try replacing the solenoids with an Albright contactor or similar. These have performed very well for us and are a totally fit and forget solution. If there is something wrong with the winch – you can bet it's not the Albright!

## **Note 1 - Battery Sensed Alternators**

Most newer vehicles, notably Land Rover Td5, Puma, Discovery 2,3,4, late 300Tdi Suzuki Vitara, Jimny etc use what is known as a battery sensed alternator.

If you connect your split charge as above, you will notice that the charge light on your dash remains illuminated and the split charge relay will not energise.

This is because the Alternator uses the feed through the bulb on your dash to measure the battery voltage and adjust it's output accordingly. On older Alternators, it was just an output that indicated whether the Alternator was charging or not.

If you suspect your vehicle has a Battery Sensed Alternator, instead of connecting the orange wire to the alternator, it must be connected to an ignition live which is dead while the starter motor is cranking the engine.

A good example of this would be the ignition power feed to your radio as normally, the radio remains off while cranking the engine.

On most vehicles this is the **RED** wire going in to the back of your radio.

If you cannot find such a live feed, just connect the orange wire to any ignition live.

Give us a ring on 01403 888 388 or email [xeng@foundry4x4.co.uk](mailto:xeng@foundry4x4.co.uk) if you still have any questions.