# REV PROJECT FORMULA-SAE-2010 INFORMATION SHEET

*This sheet to be kept by inductee*

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| **Instructor Name** | **Instructor Contact Information** |
| Brendan Waterman |  |

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| **Supervisor Name** | **Supervisor Contact Information** |
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## Driving an Electric Vehicle

Driving an electric vehicle is almost identical to driving a petrol/diesel equivalent. There are only a few differences to note.

**Before Driving the Formula-SAE-2010** *(FSE2010)*

Check the following:

* The vehicle and you are in compliance with the vehicle usage procedures (R01).
* You have read and understood the induction documents (F03).
* The vehicle is not charging and the charger is disconnected.
* Emergency stop button is not down
* The vehicle is sufficiently charged (use multimeter).
* You have the ability to contact support if necessary (a mobile phone and contact information)
* You have fastened and adjusted the the seatbelt and are wearing a full-face helmet

**Starting the Vehicle**

The vehicle is started by lifting the master E-stop (big red) button above the battery pack, then releasing the driver’s E-stop button on the dash.

**If the vehicle does not start check the following:**

* The vehicle is not currently charging.
* The emergency stop button is not down.
* The battery voltage is above 37V (if not, a warning buzzer should be sounding).
* The vehicle does not make any noise when turned on: try driving the vehicle slowly with one foot on the brake to begin with.

**Battery Level**

Electric vehicles use battery packs to supply energy to the vehicle engine.

The FSE2010 vehicle does not currently have a battery meter. Although battery voltage remains fairly steady, it can be used to estimate state of charge, where 50V is almost full and 48V almost empty.

Whenever the vehicle is not in use, the main E-stop button above the battery pack should be down. This avoids any quiescent loads on the pack. The FSE2010 vehicle can be left safely for months in this state.

When not using the vehicle for a long period (over a week), it is best to fully charge before use. The FSE2010 battery pack **should not go below 40V**, if it does: report the fault immediately to a REV instructor or the REV Project supervisor.

**Transmission**

The FSE2010 has a single-speed reduction drive, with no reverse. To drive forwards simply depress the accelerator pedal slowly.

To manouver the car backwards: depress the driver’s E-stop button and have someone push the car backwards. The car is very light so it is easy to push, but there should be a driver sitting in the car ready to use the brakes if necessary. When ready to move forwards again, release the E-stop button and drive away.

**Vehicle Charging**

The FSE2010 vehicle is charged using an off-board Kingpan KP4810 charger, which plugs in to any 10A+ 240V wall socket, and on the vehicle connects to a red/black Anderson powerpole connector near the vehicle control box (above the battery in the rear).

To charge the batteries:

* Ensure the charger is switched off (switch pointing to the “O” symbol)
* Connect the charger to a wall outlet and to the plug on the car
* Ensure the Isolation switch above the batteries is pulled up
* The toggle switch on the BMS should be in the down position
* Switch on the external charger (switch pointing to the “ | ” symbol)

The charger will stop automatically when the battery is full. As a secondary safety measure, the vehicle includes a Battery Management System (BMS) which will interrupt the charge current in case of battery faults. There is a a reset switch on the side of the control box which may have to be toggled on/off to reset the BMS for charging to start.

The main rear emergency stop button interrupts all power to/from the battery pack so must be up for charging to occur. The button should be pushed down again when charging is complete as a safety precaution.

**Breakdown Procedures**

In the event the electric vehicle has broken down or suffered a failure, press both emergency stop buttons to isolate the battery then contact a REV instructor or the REV Project supervisor.

**Emergency Procedures**

In the event of an emergency it is important put the lives of yourself and others first.

**Emergency Stop**

To perform an emergency stop and cut off all power from the batteries to the vehicle, press the large red E-Stop buttons on the dash and/or above the battery pack (preferably both for redundancy). The E-stop buttons should both be pressed in whenever the vehicle is unattended.

**Vehicle Fire Extinguisher**

The FSE2010 vehicle has no fire extinguisher on-board, but one should always be kept nearby when the vehicle is in use in case of emergency.

**Michael Building Basement Fire Extinguisher**

The fire extinguisher for the Michael building is located in the centre of the eastern wall of the basement.