

Bus Construction and awareness

This is a brief guide to Bus Construction and some of the hazards.

For most of us dealing with RTC's involving cars is a relatively standard job, but what do we do when the incident involves a Bus?

What knowledge do we have of dealing with Bus rescue and making such an incident is safe, do we know where the cut off and isolation switches are?

In this document we are going to look at some basic Bus rescue techniques and shut down procedures.



On arrival what are we thinking about? We will need to isolate the Buses systems to make the Bus safe to work on or around.

Is the engine running? If so we will need to turn it off.

Most buses do not have keys so there is a button on the vehicle dash that we need to push or turn to turn off the engine.

This document is a generic informative on buses. Bus and public transport technology is advancing all the time, this document is only relevant to the busses at the time of writing. It is worth noting that some busses remain in use for many years.



In the pictures you can see a switch; the 0 denotes the off position



If due to crash deformity to the cab area the switch is not accessible all buses will have an emergency cut off switch at the rear of the vehicle or on the side at the rear.





You can see in the pictures once you have opened the hatch there is a simple isolation button that locks, so once activated the engine can not be restarted until it has been reset.

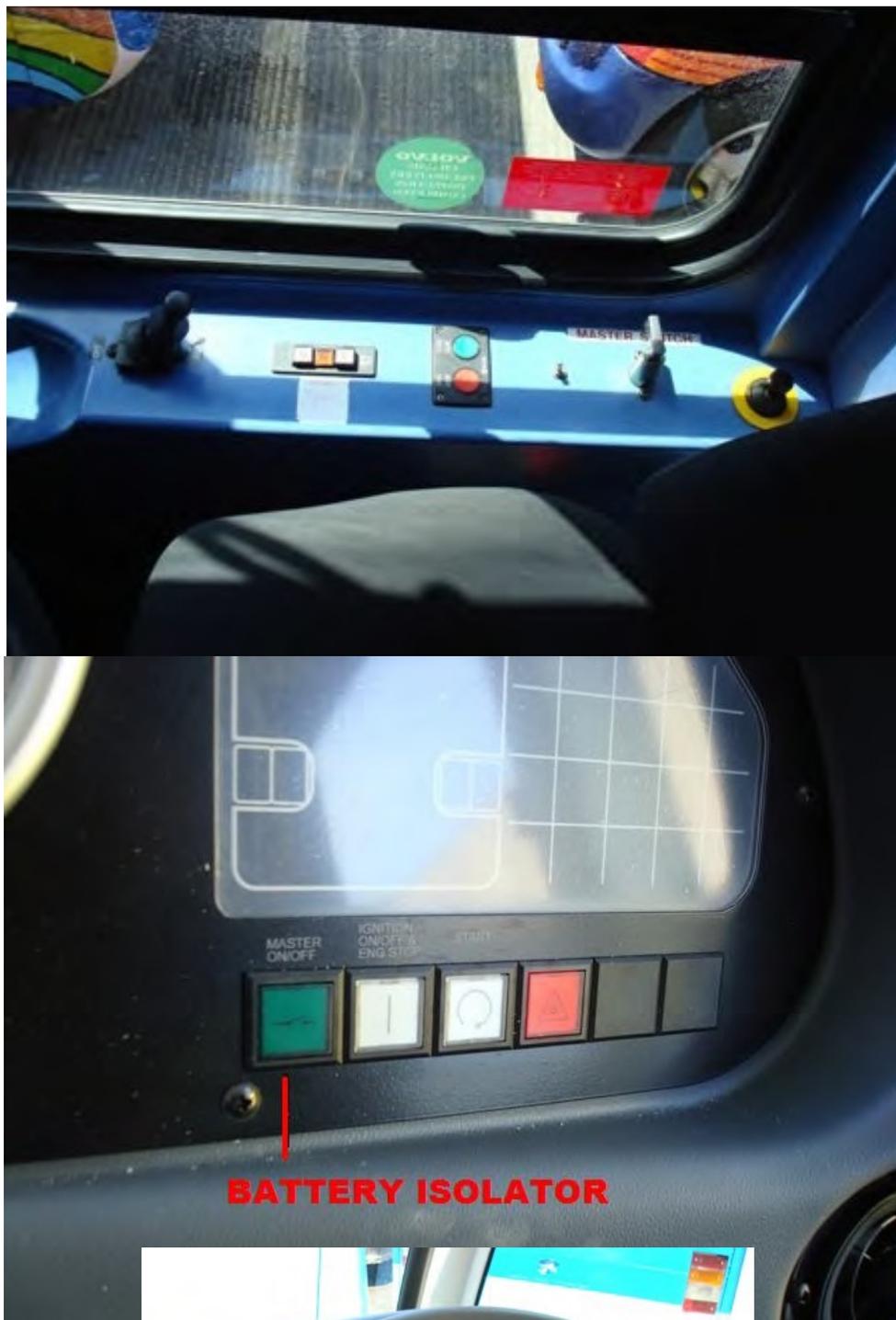
Buses are not fitted with SRS systems or seatbelts so there are no issues with safety systems, however the risk of fires is still a hazard. Newer busses might be fitted with seat belts etc. such as coaches.

The battery consists of 2 x 12v batteries

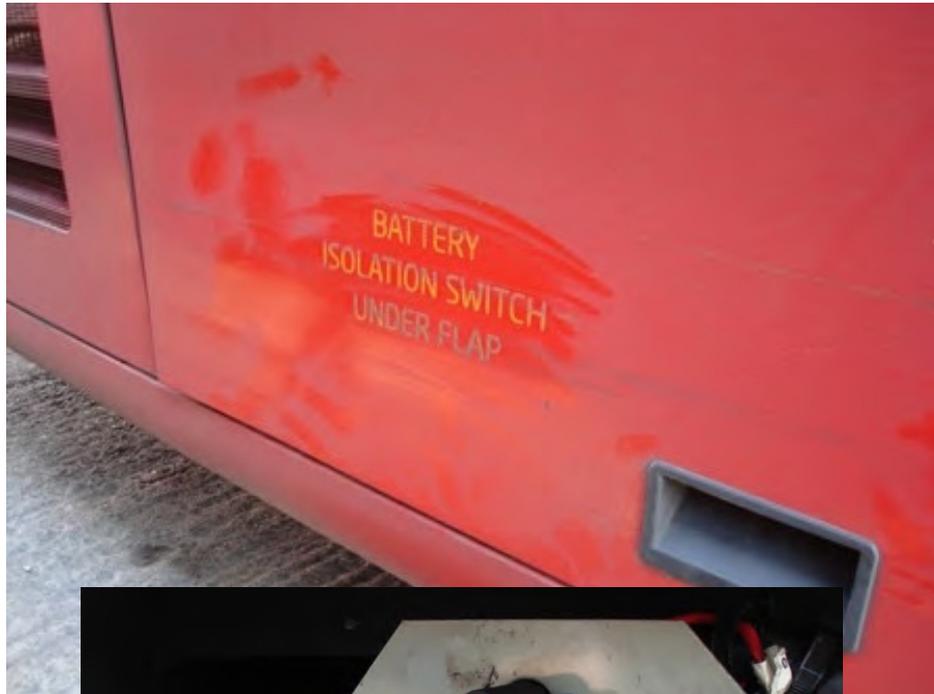
All buses will normally have a cut off switch in the cab on the drivers console, it will be either a push button or a key which you can turn and remove, and this will isolate all electrical systems.

However hazard lights and security cameras will still have power, these pose very little hazards for rescue actions.

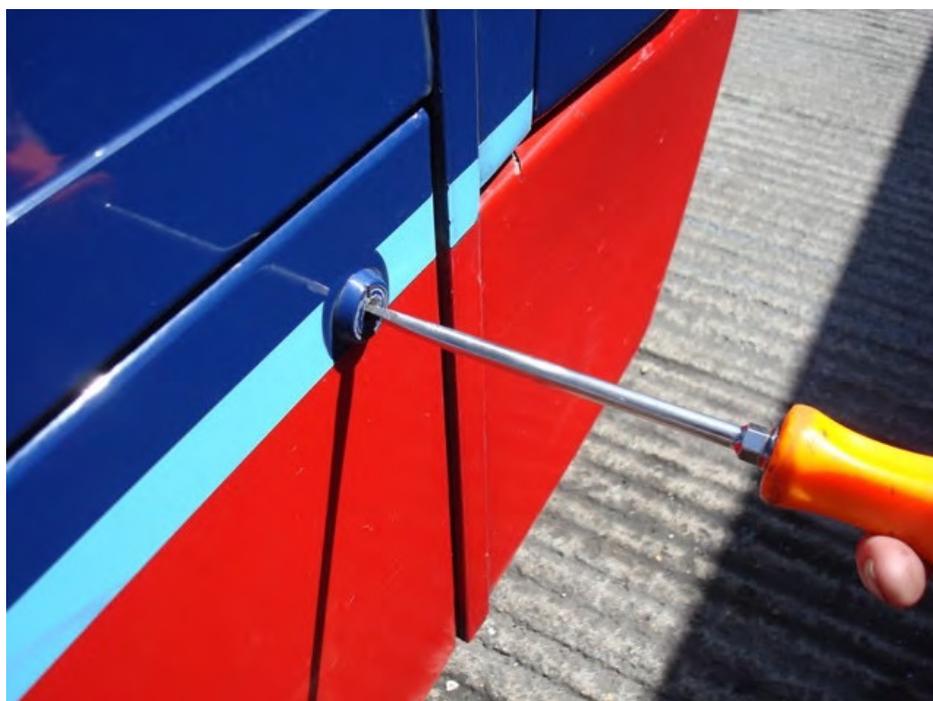




Some buses will have the battery and engine isolation switches in a side door near the rear of the vehicle that will be marked as you can see in the picture.



If you still feel that the battery cables need to be disconnected, you can access the batteries from the front or side of the bus. A budget key or screwdriver will normally open the locker where the batteries are kept. Only one set of terminals needs to be disconnected.







Vehicle stabilisation

Stabilising a Bus is a simple task utilising step chocks and blocks and wedges as standard, buses have several areas under the chassis that are strong points for stability or lifting with jacks or airbags.



Note:

Buses are fitted with (ECAS) electronic controlled air suspension-

This means that the suspension will automatically self adjust with the weight of the vehicle, so the engine must be isolated before stabilisation is carried out, or there is a risk that the suspension will try to compensate this causing movement to the vehicle.

If there is a casualty trapped under the bus then it will require localised stabilisation around the casualty before you switch off the engine. (casualty safety cell)

The suspension **WILL** not drop when the engine is turned off.

The doors do not need power to be opened in an emergency; they are normally powered by air.

If the air has been depleted, the door will open easily with a push in the marked area



If the system has air in it, you can just push the emergency door release button. However with the door system charged with air there will be a need to secure the door open as it will try and self close.

The rear doors normally open with just a handle using the guidance on the door.



Glass

The glass on the front of buses is always laminated; also the small side panels near the front will also be laminated glass that is bonded.

Some older buses the glass will just be held in by a rubber gasket



Passenger side windows will be toughened glass and can be dealt with in the same way we do cars, with a center punch and so on.

The glass can also be removed whole by removing the gasket and then peeling out the rubber, the window should be removed in an outwards direction from the bus.

Removing the glass whole will require good manual handling as it will be very heavy.



Bus construction

Buses are mainly constructed from box and Ali framework coated in Fibreglass for looks. There are no real problems with extrication techniques due to their light construction.

Most cutting can be carried out with a recip saw, however you will have to draw your own conclusion through training and operational experience.

Other hazards

The diesel tank is normally fitted in close proximity to the driver's compartment and sometimes under the stairs on double deckers.

Seats:

Space will be at a premium during a major bus incident with mass casualties so routes in and out of the bus will need to be planned and good tool use monitored.

Seats can be cut free with either a recipe saw or hydraulics, as they are fitted with a simple steel tube or bracket.



When removing side panels on a bus or coach we will come across strengthening bars within the side panels, we will need to find their location to assist with cutting operations by using tools such as metal shears, nibblers etc Trying to fold the panel down against these side bars will prove very difficult.



[The following pictures have been supplied by Jimmy Safstrom from: www.heavyrescue.se](http://www.heavyrescue.se)

These pictures show the many different types of materials used such as wood, aluminium, carbon fiber and steel in bus construction today.





Scania



The following three are Volvo:





I hope you have found this information useful, if you have anything to add as always please send me the details and I will add it to this topic rtc.rescue@gmail.com

I would like to thank Mr Stuart Vass (Technical Engineer and Fire Fighter) for assisting me with his vast knowledge in this field.