

Operational Considerations for Hybrids

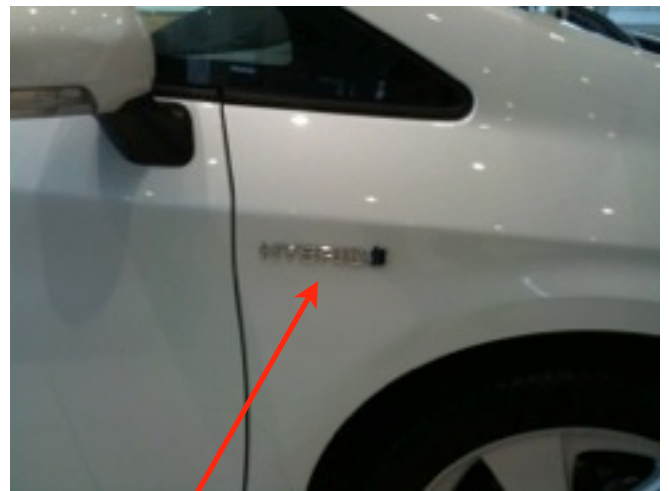
This is a basic guide to operational procedures when dealing with incidents involving Hybrid vehicles, this information is based on the Toyota Prius, however most of these procedures will be the same for most Hybrids.

This information is taken from the vehicle dealer and from the ERG, the difference is that I have simplified this to make it user friendly.

This information is not to be used instead of your SOP's / operating procedures.

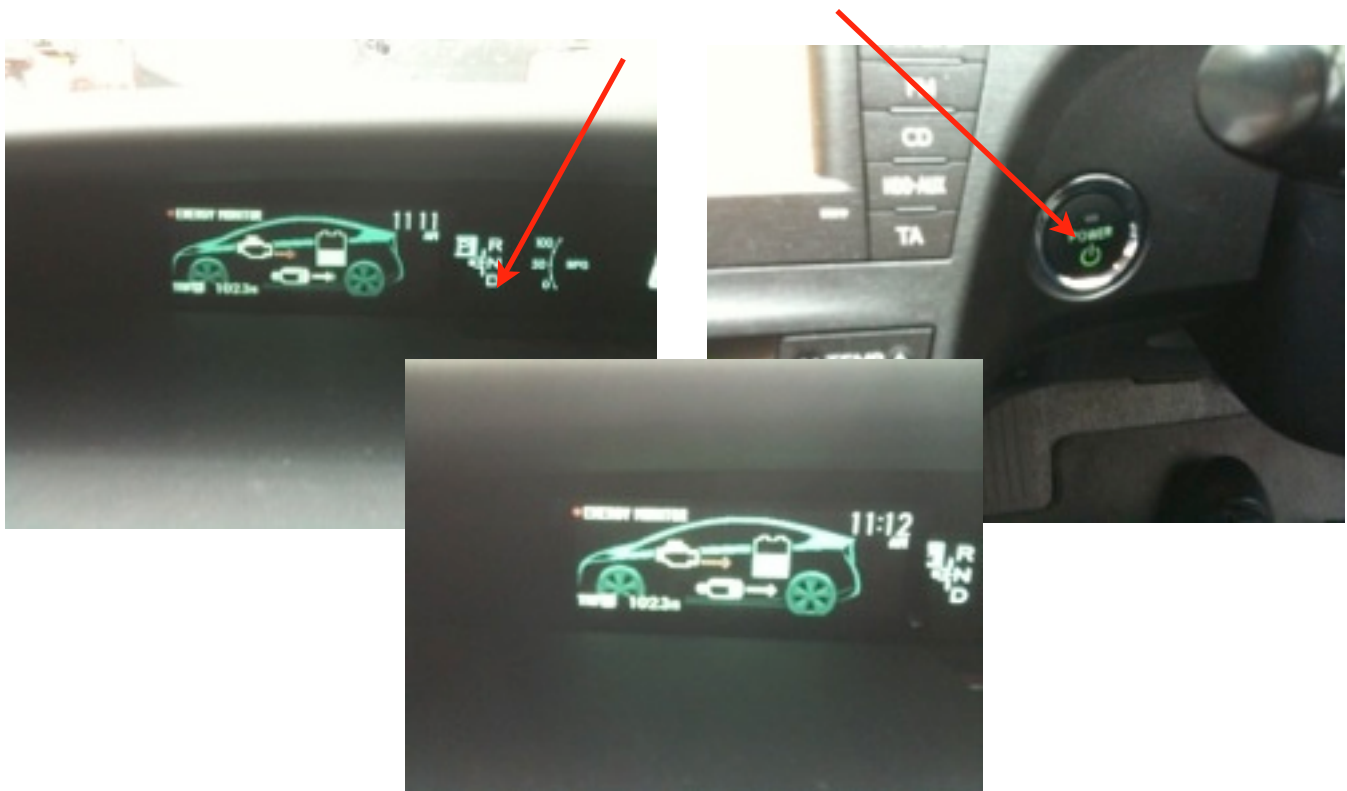
Lets start from the beginning, I am not going to talk about all the different types of Hybrids out there today or what may come in the future.

Hybrid identification, the markings on the vehicles can be very small and will need a thorough 360° assessment of the scene and vehicles involved to spot the Hybrid markings, if these have been accident damaged then you can also look at the dash-console and this will also give you the information you need.



You can see in these pictures that the markings are fairly small and can be easily missed due to accident damage

If these markings are not present or there is doubt as to the automotive power, have a look at the dash-console, this will give you the information you need. Look for a power button and readouts on the dash area.



As you can see in the photos the readouts will give you a good idea of what you are dealing with.

NOW WHAT

We have identified that this is a Hybrid vehicle, our first point of action should be to chock the front wheels, why is this, well if the vehicle comes to a stop the system will go into standby mode, which means there will be no engine noise or sound, this could lead rescuers to assume the engine is off, this is not the case. if the drivers foot is resting on the brake this will put the system into standby, if their foot is moved off the pedal by a rescuer the vehicle can instantly power up and move forward anything up to 20mph, this poses a huge hazard to personnel in the frontal area of the vehicle. **CHOCK the WHEELS first.**

We now have to locate the power button and press it if the dash lights are lit, this will turn off the power systems. We also need to locate the SMART ENTRY (otherwise known as ready go, or keyless go) key, this does not have to be in an ignition slot, there may not even be an ignition slot, it has to be within 16' or 5 m of the vehicle and it powers up the systems and unlocks the doors etc.



You may notice that there is no visible handbrake, this is positioned next to the foot brake, it is a small pedal you just push down with your foot to operate the handbrake. Alternatively you can push the park button, however this can automatically come on depending on when the system is shut down.



Once we have shut down the vehicle with these simple actions, we need to make sure we remove the key, this can be anywhere within the vehicle, drivers pocket, glove compartment etc; this needs to be kept a minimum of 16 foot from the vehicle to avoid the systems powering up.

Most hybrids power cables are ORANGE in color, but some will have blue cables for medium voltage Hybrids.



These cables should be avoided at all costs, they can carry anything up to 600 volts.

These vehicles will also have a 12 volt battery located somewhere within the vehicle, in the Prius its located in the boot / trunk, this also needs to be isolated to power down the SRS systems.



The Orange cables will have a built in safety device so that in the event of a crash they should automatically shut down and self isolate to make them safe, however unless you pull the main plug for the HV battery system they may still be holding 600 volts, so if the safety systems have not activated or we haven't shut down the HV system, they may still be live, so if the cables in the engine compartment are touching the bonnet/hood they may energize the whole vehicle, so do not get complacent.

These systems are designed to be very safe in a crash, but we must always remain vigilant.





This is the main isolator plug that needs to be removed you slide it then pull it out, this prevents accidental removal.

This is a very basic document on dealing with Hybrids, there is a huge range on the roads today and shut down procedures will vary, but if we follow these basic guidelines we should not be far off making our job a bit safer. With all that said our extrication evolutions will remain the same and will not be effected by the HV system. The HV cables will run along the underside of the vehicle, not through the posts we will be cutting.

To summaries-carry out a thorough vehicle assessment, Hybrid identified, chock the wheels, shut down the systems, remove the smart key, remove the main isolation switch, disconnect the 12 volt once we have operated electric windows etc, carry out extrication.

Every situation will be different so we will need to modify and adapt this information to suit our needs.

As always please send me any comments on incorrect information and I will change this document as and when.