

CHARGER ON-BOARD – CHARGER ON THE WALL?

Battery charging of standby and emergency vehicles has been around for a long time, and fire services have probably done it for longer than most others.

In more recent years ambulance services have taken to it with a vengeance due to changes in operating practices and on-board equipment, and so it is interesting to look at the differences in how these two services do what is essentially the same job.

Fire Services that have employed battery charging have gone about it in two main ways: battery charger on board, fed by mains, usually 230V AC, and battery charger on the wall, feeding 24V DC to the vehicle. On-board chargers are far more widespread because it is far more efficient, but there are still some fleets using on the wall chargers.

Ambulance Services are on the whole newer to the whole subject, and uniformly use on-board chargers fed by 115V or 230V AC mains. One good reason for this is that nearly all modern ambulances have at least two, and often three, separate battery systems to ensure that starting of the engine cannot be affected by drain caused by auxiliary and parasitic loads.

Independent sensing and charging of separate battery systems is much easier from a charger or chargers mounted within the vehicle.

Some have very fancy systems on-board for controlling their electrical systems. These are often arguably over the top and beyond the comprehension of the operators and/or of many of those who must maintain these vehicles. These are another subject.

What's the Best Way?

Simple answer is "The one that works properly for you". However, it is sometimes too easy to be sold on something that isn't quite the right thing for the job today, and even more so for the ever-changing future.

On the Wall Chargers:

Benefit? Provide safe charging at low voltage, and no mains cables that have to be installed and maintained by qualified electricians.

Drawback? DC doesn't travel well, so charging cables need to be kept short. In the case of reels and drop cables, the cable length needs to be looked at very carefully. Voltage and current drops are likely, and also less accurate monitoring of battery condition may result. Not so easy where more than one battery system is fitted, or where 12 and 24 volt systems need to be charged on the vehicle. Rank outsider where engine heaters are fitted. It wasn't so bad in the past when auto-electrical systems were simpler, but these days more current is needed all the time, and constant parasitic loads e.g. radios, PCs faxes, trackers etc. all exacerbate the problem.

On-Board Chargers:

Benefit? Accurate monitoring of battery condition, easy charging of multi-battery & different voltage systems, supply of heavier current consuming items, all through low current AC cables. Ideal where constant parasitic loads are present, and the only

answer where engine heaters or brake tank top-up compressors are fitted. Vehicles can also be charged at any mains point.

Drawback? Mains voltage onto vehicles, which some people don't like.

Is Mains Voltage Hazardous on Vehicles?

If the equipment is the proper equipment for the job, fitted to comply with modern regulations, the hazards are very small. Add to that some careful planning in siting of drop cables, use of auto dropout switches (Auto-Safe), and using Auto-Ejects and nobody ever needs to handle a live mains cable. **Nil hazard.**

Is Connecting DC Hazardous?

It can be. If there is a big current demand at the time of connection, arcing can occur. Modern vehicle electronics do not like this at all, and it can have other more basic effects which can be undesirable. An isolator switch can help with this, but will your operatives use it properly?

OVERALL, WHICH WAY IS BETTER?

First of all, I must say that we have no axe to grind. We make equipment that does the job either way, so are commercially impartial on the issue.

Sometimes there are reasons why mains cannot be used onto vehicles (some petrochemical plants etc.) and there are reasons why DC onto vehicles just won't work.

From an engineering point of view, most agree that mains onto the vehicle provides the superior system for a number of reasons, and far outweighs the drawbacks.

I personally have never heard of anybody being electrocuted by a mains-fed vehicle, even though these are often parked and connected out of doors in all weathers. It may also be borne in mind that boats in marinas, where the hazard may be higher, usually have a 230V shore line to them.

Under the relevant regulations, 230 volts AC is the appropriate supply voltage to vehicles.

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