

This photo was a staged shoot



The truth about Kill cords

Fleshing out the legal requirements, dangers and debates regarding speedboat safety



What are kill cords?

The kill cord, or 'engine safety cut-out switch' to give it its proper name, is a device used to stop the engine in the event of the helmsperson being thrown out of their seat. It consists of a length of cord or plastic wire connected to a kill switch on the engine or dashboard of the boat. One end of the kill cord has a plastic collar to hold the switch open, the other has a clip on it, which can be attached directly to the helmsperson's lifejacket, or made into a loop which is then passed around their wrist or thigh. If the helmsperson is thrown from their seat by a sudden manoeuvre, such as hitting the back of a wave or a sudden loss of grip at the stern, the kill cord is

pulled from the dash, cutting the engine and preventing further injury from the spinning propeller.

Why are kill cords in the news?

Because of a tragic accident on May 5 in which two people died and two more were badly injured near Padstow in Cornwall. All six family members were thrown from their 8m RIB, which then continued to circle around them killing the father and eight-year-old daughter and badly injuring the mother and four-year-old son before it was brought under control by a local ski instructor. Although the Marine Accident Investigation Branch (MAIB) has not

yet published its report on the accident, it did take the unusual step of issuing a safety bulletin confirming that the boat's kill cord was not being worn at the time of the accident and recommending four courses of action.

What are the MAIB's recommendations?

That all owners and operators of vessels fitted with kill cords:

- 1) Test them regularly to ensure that the engine stops when the kill cord mechanism is operated.
- 2) Make sure that the cord is in good condition.
- 3) Always attach the cord securely to the driver, ideally before the engine is

started, but certainly before the boat is put in gear.

4) Stop the engine before transferring the cord to another driver.

How does it work?

It's a very simple device that relies on a spring-loaded button or toggle switch to complete the electrical circuit controlling the engine's ignition. In its natural resting position, the switch is off and the circuit is broken so the engine cannot run unless the switch is held open by the appropriate kill cord.

Does every boat have a kill cord?

No, large boats with inboard engines

and deep cockpits rarely do as there is little likelihood of the helmsperson being thrown overboard. It tends to be smaller, faster open boats such as RIBs, sportsboats and tenders that have them fitted.

Are RIBs and sportsboats legally required to have them?

Remarkably there is no legal requirement for a kill cord to be fitted to any kind of boat in the Recreational Craft Directive (RCD) – the safety standards to which all boats in the EU have to conform. This may be because of the difficulty of defining what type of



Kill cords have remained unchanged for decades but the Padstow accident has focussed attention on why some people still aren't using them

boat does or doesn't require a kill cord. Any attempt to base it on size or speed would appear arbitrary.

The only legal requirement we could find was section 7.1.7 of the Inland Waters Small Passenger Boat Code, which states that, "All inflatable boats, boats fitted with buoyant collar, and open boats that achieve planing speed, when fitted with remote throttle controls, should be fitted with a kill cord, to be used at all times during navigation."

What about engine manufacturers?

The only mention of outboard engines in the RCD states that "all boats with outboard engines shall have a device to prevent starting the engine in gear. The exception to this is for engines either producing less than 500N of thrust, or those which have their thrust limited to 500N at the time of starting".

This is very different to a kill cord, which not only prevents the engine being started when it's not in place but also cuts the engine when it is removed. Despite the lack of boatbuilding legislation every outboard engine manufacturer we spoke to does supply a kill cord with every engine sold, whether it's for a 2hp tiller-steered tender or a 350hp 50-knot RIB. Most manufacturers of sportsboats and RIBs powered by inboard engines also choose to fit them.

Not wearing a kill cord could potentially affect an insurance claim in the event of an accident

Why is that?

Although no engine manufacturer would openly admit it, the most compelling reason is likely to be the threat of litigation. The US is by far the biggest market for outboard engines and sportsboats, it is also the litigation capital of the world. If it could be proved that boat and engine manufacturers were aware that such a device would help prevent deaths and injuries but chose not to fit it, they could risk being sued by surviving relatives or victims of this type of accident.

You only have to look at the case of American Jacob Brochtrup, who successfully sued Brunswick for failing to fit a propeller guard after his friend Patrick Houston accidentally reversed over him in the Sea Ray 176 they were using. He won \$3.8 million dollars on the basis that Brunswick had failed in its duty of care by not fitting a propeller guard as standard.

Are you legally required to use a kill cord if fitted?

There is currently no legal obligation for leisure boat owners to wear a kill cord even if it is fitted to the boat they are driving. However, there may be a clause

in your insurance policy which requires you to operate the boat in a safe manner and which could potentially count against you in any litigation proceedings related to an insurance claim. Commercial operators fall under a different code of practice and are required to wear a kill cord when fitted.

What does the RYA have to say about the use of kill cords?

How to use a kill cord is a key part of the Powerboat Level 1 and 2 training courses. In addition to the MAIB's safety bulletin it also advises:

"That you attach the kill cord around your leg, rather than your wrist (to avoid it becoming tangled in the steering or throttle mechanisms).

That you should not clip it to any clothing or lifejacket, which could rip or become detached from the driver instead of from the dashboard switch.

That you should not attempt to extend the length of the kill cord to give greater freedom of movement around the boat.

That it should not be left exposed to the elements as extremes of temperature and UV light may harm the lanyard in the long term."

Why are some people not wearing kill cords?

Until the report on the Padstow accident is made public we won't know for certain why the kill cord was not being worn in this instance. What is clear is that a significant proportion of boat owners are either ignoring, forgetting or deliberately choosing not to wear the kill cord in certain circumstances.

You only have to look around you in any marina or popular anchorage to see people bombing around in tenders and sportsboats with the kill cord clearly dangling from the outboard engine's tiller or the boat's dashboard. Even many experienced and safety-conscious boat owners will admit to certain occasions, such as manoeuvring around a marina, putting out fenders or checking fishing lines or ski ropes, when they have chosen to detach themselves from the kill cord and leave the engine idling in neutral.

Interestingly the RNLI does not use kill cords on its inshore lifeboats and RIBs precisely because it limits crews' ability to move around the craft at short notice, although the boats are all fitted with sprung-hand throttles that return to idle when released.

Is it ever safe to leave the engine running without wearing a kill cord?

Not really as there is always a risk that a child or guest could accidentally knock the engine into gear, dumping the only qualified helmsperson into the sea. This has become increasingly likely with the advent of fly-by-wire throttle controls, which have a very light action and lack the manual safety lock-outs fitted to the previous generation of cable controlled engines.

How frequent are these accidents?

In the UK at least fatal accidents such as this are relatively rare. Since 2005 the Marine Accident Investigation Branch has records of seven fatalities caused by people being thrown from a boat while not wearing a kill cord and then being run down by the same boat. That is still seven deaths too many in

MAIB KILL CORD STATS

Year	Deaths	Injuries	Cases
2005	2	1	4
2006	1	3	3
2007	2	0	4
2008	0	0	0
2009	0	1	1
2010	0	2	2
2011	0	0	2

Dozens of different kill cord attachments but they all work in much the same way



The Autotether wireless system allows movement around the boat but triggers the kill switch if you fall overboard



Some boat manufacturers prefer to fit this toggle style kill switch



The Coast Key system is a more sophisticated wireless solution



most people's books, especially since the chances are they all would have survived if the helmsperson had been wearing a kill cord.

There were a further 11 people injured during that same period in similar circumstances and a total of 19 other incidents of vessels continuing out of control because a kill cord was not properly connected and/or used.

However, even this number is likely to be the tip of the iceberg as there is no requirement for non-commercial vessels to report incidents of this kind and only limited requirements for small commercial vessels. A trawl through the Maritime and Coastguard Agency (MCA) website for example turned up no less than three such incidents in a single month during August 2010.

Are kill cords fit for purpose?

There is no doubt that kill cords, when used correctly, are an effective, simple,

affordable and largely reliable solution to this kind of accident. However, it is equally clear that far too many people are not using them either out of ignorance, forgetfulness or choice. The bigger question is what can be done to ensure that all three of these reasons are minimised or eliminated.

Are there any existing alternatives?

Yes, we know of at least two wireless kill-cord systems already on the market – the Autotether system designed in the US and sold through Fastnet Marine in the UK (www.fastnetmarine.com), and the Coast Key system from Norway sold in the UK through Coast Key UK (www.coastkey.co.uk).

Both devices rely on small battery-powered radio transmitters which you wear around your neck or clip to you securely. These send a continuous signal to a control box mounted on the helm. As soon as they lose contact with

the remote fob, they cut the engine just like a kill cord.

Are they any good?

Yes, we have tested the Autotether system ourselves (see Tried and Tested p96) and visited Sea View Yacht Club on the Isle of Wight, which is trialling the Coast Key on its fleet of small RIBs. Both devices do what they say on the tin and so far seem to be reliable. Some overseas boatyards such as Goldfish, Fjord and Arctic Blue RIBs even fit the Coast Key system as standard or optional equipment.

So why isn't everybody using them?

Because the market is driven by the outboard engine and sportsboat manufacturers in the US. The additional cost, complexity and fear of litigation mean that none of them are yet prepared to replace the existing form of manual kill cord.

Are there any alternative solutions?

We put this question to the mby.com forum and on our Facebook and Twitter accounts and were overwhelmed with

There have been seven fatalities since 2005 and a total of 19 incidents involving out-of-control vessels

possible suggestions. We haven't got space to publish them all here but we have distilled the responses into the six common themes described below along with their main pros and cons. Many thanks to all who responded.

What does MBY think?

Our opinion is that technology moves on and yet the design of the kill cord

has not changed for many years. There may be valid reasons for this but that should not stop us having the debate and looking into better, more user-friendly alternatives.

Any new solution needs to be at least as reliable as the current kill cord (although it's a myth that they are foolproof as the MAIB records show one fatality and at least one other

accident caused by faulty kill cords) and not prohibitively expensive. Ideally it should also work for small tiller-steered outboard engines as well as larger, faster boats even if it takes time to filter down the range.

We are convinced that if the major boat and engine manufacturers have the will and the desire to design a better solution, they could deliver a much

slicker device that boat owners would use, appreciate and be prepared to pay a premium for. We look forward to seeing if they rise to the challenge.

NEXT MONTH We look at the best new ideas, trial some prototype devices and see what manufacturers and boating organisations make of them. If you'd like to assist please email us at mby@ipcmedia.com **IMBY**

Readers' suggestions

● WIRELESS KILL CORDS

The potential for this has already been proven by the Autotether and Coast Key devices but both of these rely on active radio transmitters that require batteries in the remote device in order to function. Passive Radio Frequency Identification (RFID) tags on the other hand need no power source to operate, can be encased in plastic or silicone to make them 100% waterproof and cost pennies to manufacture. It's this technology which is used in everything from wireless credit card payments to keyless cars, festival wristbands and even pet passport implants. All it needs is a small black box and an antennae in the helm which sends out a high-frequency pulse. This energises the battery-less tag enabling it to send a unique ID code back to the receiver. This form of passive RFID only works over a distance of a few feet so as soon as the person wearing the tag falls overboard or moves out of range, the engine cuts or in the case of a fly-by-wire throttle could slowly be brought back to neutral.

Pros: No batteries in the remote fob, waterproof, no cord to tangle around the wheel or throttle, much more convenient and user friendly than a physical tether.

Cons: Without a battery the range is limited to a few feet at most so limited freedom to move around the boat unless secondary antennas are fitted around the cockpit. Still relies on the operator to use/carry/wear the fob and not leave it attached to the key ring. More expensive than a manual kill cord and arguably more prone to failure. Some form of manual override would still be required in the event of system failure or to recover the MOB.

● HELM SENSORS

Some form of physical or electronic device which senses whether the helm position is occupied or not. This could be a pressure pad in the helm seat and/or floor with a three-

second delay to take account of momentary weightlessness when jumping over waves or an optical or thermal sensor similar to a burglar alarm. Alternatively the wheel, throttle or even a combination of the two could be fitted with an electrical sensor that would trigger the cut-out switch if neither one was touched for more than a few seconds.

Pros: Much harder to avoid or forget than a manual or wireless kill cord.



Radio Frequency Identification (RFID) tags can be encased in waterproof wristbands

Cons: It may be possible to trick or confuse the system by taping over the pressure switch or light sensor and any heat sensor would need to take account of wet weather clothing and extremes of temperatures. We all know how unreliable those infrared taps and hand dryers can be!

● SPRING-LOADED FOOT OR HAND THROTTLES

This simple solution relies on a physical spring returning the throttle to idle if pressure is not continually applied to it. Every car and most race boats use a sprung-foot throttle while PWCs and RNLI boats use a sprung-hand throttle so why not leisure boats?

Pros: Simple, effective and hard to get round. Already used on most small tiller-steered outboards.

Cons: Fine for a PWC when your hand is always securely positioned in one place (i.e. wrapped around a handle bar) but much less practical if you are bouncing over waves trying to keep the throttle steady in a boat. There are also valid reasons for wanting to cruise at a constant pace for long periods of time without having to keep one hand permanently on the throttle.

A sensor in the wheel could cut the engine if untouched for more than a few seconds



● LEGISLATION

The kill cord works fine if people use them, so you should make it a legal requirement for the helmsperson to wear it. This is similar to the early days of car seatbelts when drivers were aware of their safety benefits but still chose not to wear them. Now that it is a legal requirement people wear seatbelts as a matter of course.

Pros: No costly or fallible changes in technology just a legal ruling that kill cords must be worn backed up by a few £60 fines to drum it into people.

Cons: Almost impossible to enforce – how could police see and prove that people weren't wearing a kill cord? The remote threat of a £60 fine is unlikely to provide much deterrent. Any attempt to legislate could be a slippery slope to boat licensing and creates yet another barrier to boat ownership.

● BETTER TRAINING AND AWARENESS

If the government is serious about improving boat safety it should focus its efforts on awareness with widespread media campaigns backed up by RYA and RNLI advice encouraging people to use their kill cords. The 'Clunk, click every trip' television adverts and drink driving campaigns did more to change attitudes than any legislation.



Should kill cords and boat training become mandatory for all?

Pros: If it becomes socially unacceptable not to wear a kill cord, people will quickly change their habits. **Cons:** The majority of boat owners already know how to use a kill cord and the risks of not doing so but some still forget or choose not to.

● NO CHANGE

The most popular response on our forum on the basis that horrendous as these accidents are, they are few and far between. Supporters of this approach also argue that the tragic accident in Padstow has done more to ensure people use kill cords than any amount of legislation or technological improvements.

Pros: The easiest option of all **Cons:** There was an equally high-profile accident in which one person was killed during a customer sea trial of a RIB at the Southampton Boat Show in 2000 but that didn't change behaviour enough to prevent the recent Padstow accident. How long before the memory of this fades, too?