

SPECIAL REPORT

WHOLE BODY VIBRATIONS

Special report on the problems of mitigating the effects of shocks, vibrations and impacts on small high speed craft.

LIST OF ABBREVIATIONS

WBV = Whole body vibration
HSC = High speed craft
HF = Human factors
MSI = Motion sickness incidence
MIF = Motion induced fatigue
RS = Repeated shock
SA = Situational awareness

This report is for Helmsmen, Navigators, Watch keepers, general Crew members and HSC boat designers.

There is a lack of understanding on the subject of shock mitigation on HSC's. There appears to be reams of information to hand but very little if anything is done or achieved. Nearly every vessel I have been on or driven have 2, 3 or 4 massive engines and rarely had shock seats, suitable for the job in hand or not in the right position, with no real thought as to who is going to be using the vessel. Tests show, that EU WBV parameters can be exceeded within a few minutes rather than daily.

Not all transiting personnel will be familiar with the motion and repeated shock and vibration they are about to receive. Even with an in depth safety briefing, which takes time, which is not always available and which may not be adequate, prior to commencing a journey on a HSC.

If no briefing is given then the personnel will have little idea as to what to expect and how to use their body's muscles to help alleviate the effects of some of the shocks received.

Even with experience the Helmsman is probably the only person who will have any idea, due to the sea state, how rough the trip is going to be. The crew and passengers, even over short periods of exposure to these shocks will suffer from fatigue, possible motion sickness, which can then lead to much higher probabilities of acute or serious injuries. As personnel become tired their muscles and balance become ineffective.

The majority of research and testing on WBV is with the body's response to vibration and shock in the vertical direction as an upright posture with the spine in it's natural 'S' shape, is recognized as the most suitable. This is mainly due to the fact that at the present time, the technology available can only present information or predictions on

spinal accelerations in the lateral and longitude directions and very limited when involving shock seating.

The head and neck are not well adapted to withstanding lateral and longitudinal shocks. When seated the whiplash effect from a roll accelerated slam has the potential to cause significant injury to the head and/or neck areas, as the impact in most part is unexpected.

These lateral shocks also put significant loads on the crew/passengers shoulders, arms and wrists, as they try to hold onto anything to keep them from being thrown from the boat, which incurs muscle fatigue.

These types of injury or fatigue can easily happen on the first day of a long transit of a few days. Now you have a crew and personnel who are all tired and depending on how hard the next day will be, can easily begin to suffer minor injuries which they don't know about. If this goes into a third day everything can change drastically with personnel/passengers saying they are fine because they know there are time constraints for completing their operation. This is now a recipe for serious injury and/or worse. Everyone should feel ok and prepared to call short an operation, regardless of the consequences if these injuries are to be avoided or more must be done to alleviate these injuries being caused in the first place.

TESTIMONIALS

Good morning Mike

Thank you for your email.

You may recall that you kindly provided your decking in 2014 for my then UK demo RIB a Parker 750 Baltic known as Never Enough. You kindly supplied just in time for the last two legs of the 999 Round Britain Challenge, which was being undertaken by Water UK Search & Rescue. The Challenge was completed and WUKSART very much appreciated having your deck even if it was for the last two legs. I kept the demo rib for another two years and very much enjoyed the benefit of your decking especially since I tend to stand most of the time in all weather conditions. Early 2016 I had a demo for VISAR (Virgin Islands Search and Rescue) and we took the rib round the Isle of Wight. This was a successful demo and a year later VISAR confirmed with us their order for a Parker 1000 Baltic with Wolf Shock mitigation decking. The teams prefer to stand and your decking is a great asset for them as it reduces / absorbs considerably the shocks which they experience when hard and fast driving in serious sea conditions

Regards
Andre

Andre Scott – Director
A.H.Parker & Sons (Gt Britain) Ltd

Hello Mike

Good to hear from you and hope your initiative goes well:

“We offer Wolf Shock flooring technology as a practical and cost effective solution to reduce shock, vibration and noise resulting in a more comfortable ride and improved ergonomics for crew, technicians or passengers alike.”

Guy

Guy Whitaker

Chief Executive

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Dear Mike,

I first used Wolf Shock flooring on my 7.5m open Rib, which had no suspension seats. It was remarkable in reducing the wave impact such that it was more comfortable to stand than to sit, in a sea larger than force 3! It was easy to fit and to clean (it just lifted up so that one could clean underneath simply).

I then bought a 10.5m Rib, which is semi-enclosed. I had no hesitation in asking for Wolf Shock flooring to be incorporated within the floor design. My new Rib has four suspension seats and two normal jockey seats and the flooring enables passengers to walk about in comfort. It is again easy to clean and take up so that the underneath can be cleaned.

I fully recommend it for anyone who wants a ride that eases the stress on the back and legs.

Yours,

Richard Compton Maclean”

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Dear Mike

Three years ago I purchased Wolf Shock flooring for our operational charter rib.

Prior to the purchase we did a set of sea trials aboard a RIB testing with and without the flooring in place. The difference was very noticeable on shock from repeated slamming at high speeds. This was sufficient for me to place an order for Wolf Shock mitigating flooring for our 8.5 metre charter RIB.

We opted to have a teak deck top surface to match the remainder of the boat and had sections made for the whole passenger and helm areas.

This flooring has been in constant use over the years and has not failed or changed in its condition and operational capability. There is no doubt as the skipper and business owner that the flooring reduces the impact of fast boat trips and provides additional protection for those aboard from significant impact.

Prior to the supply I could leave after a days operational chartering with very tired legs and some cramp forming later in the day. I have not changed anything but the flooring and the conditions I described before using it have all but diminished. We looked at other forms of shock reduction including suspension seating, which was completely non viable in financial terms for all seating and also due to having to change settings on seats for each client and also the issue of moving parts on seats in close proximity to passengers

I thoroughly recommend this flooring as a safe and cost effective way to reduce shock

Ian

Ian Winson

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