C-Tecnics
subsea equipment

JOK II © DIVER RECOVERY HARNESS

Of course it's an upgrade incorporating diver feedback - this is how we work with our customers!

The JOK II is a CE-Marked Diver recovery harness to permit recovery of a fully-kitted diver from the water in air diving or bell diving conditions. Lifting can be via a rear of neck 'D' Ring or with a spreader bar across the two front of harness lifting points. The under-leg straps are essential for diver recovery. It is important to differentiate between certified lifting points and lightweight tool attachment points - the special profile-cut 'D' rings make no doubt which to use, and assist the diver in poor visibility or stressed conditions. The Umbilical connection point is also load tested, but is adjustable as to its position, which allows divers of different sizes to slide it into position and lock it in the most suitable place.

Testing

Very few diver recovery harnesses have ever been tested to ensure that they actually support the diver when he needs it. Life Support Engineering (LSE) developed a rigorous test protocol and procedure when designing the Mk1 harness and continue this striving for the best with the MKII.

The JOK II harness was tested at 900Kg/N with no failure of stitching or webbing. The special profile cut 'D' rings were selected to overcome any doubts which may occur when using normal welded 'D' rings for lifting purposes as we uncovered that the manufacturers of these traditional items would not load certify them as they could not guarantee the weld quality.

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As no CE standard existed for diver recovery harnesses LSE adopted a pragmatic approach to the creation of such a standard. Dynamic loading was potentially an issue if a diver were to fall when being recovered, or exiting, from the water or indeed if the diver was to be effected by swell or waves at the point of surface recovery. The routing of the webbing had to be changed from some of the early design of one piece 'wrap round' webbing as it simply wouldn't take the strain in testing – we have proven that many other designs are simply inadequate. The weight of a fully kitted diver was estimated as 150kg allowing for suit, bail-out and other equipment. A 6:1 safety factor was then used to provide the load testing requirement – similar to other safety-critical harnesses.

Previous Designs

Group HSE Director Alan Forsyth of International diving contractor Subsea7, conducted a study in diver recovery equipment as part of his MSc thesis, and identified a number of shortfalls in design and application. Typical were lack of clearly identified lifting points leading to accidental use of lightweight tool 'D' rings as lifting points, no recognised design or test standard, no regular inspection criteria as per other lifting equipment, 'customising' of the harnesses by divers leading to compromising of the strength of the harness (e.g. holes made in the straps to accept helmet bungee cords), slippage of the shoulder straps off the diver at chest level when working, and poor ergonomics when interfacing with diver's equipment.

Diver Input

We invited experienced divers from a number of companies to provide input to the new harness design. This input has been invaluable as many problems were raised and solved which we didn't even know existed! So, we added the extra 'D' rings, changed the shape of the recovery rings to be more obvious and tactile, added the chest strap to stop shoulder straps slipping off when the diver is crouched and working, and re-positioned some of the strap routings to suit equipment and improve diver comfort. The waist strap buckle was also changed to pin-style buckle for additional adjustment and security.

Maintenance & Testing

As per other lifting equipment it is strongly recommended that the diver's recovery harness is added to the company's Planned Maintenance System (PMS). The harness should be inspected by a 'competent person' every 6 months for any sign of abrasion or stitching failure, along with other damage to component parts etc. Consideration should be given to adopting IMCA's policy on such life support equipment to ensure is continues being fi t for purpose. Refer to IMCA document DESIGN D018 detail sheet 34.