IMCA Safety Flash 06/07

July 2007

These flashes summarise key safety matters and incidents, allowing wider dissemination of lessons learned from them. The information below has been provided in good faith by members and should be reviewed individually by recipients, who will determine its relevance to their own operations.

The effectiveness of the IMCA safety flash system depends on receiving reports from members in order to pass on information and avoid repeat incidents. Please consider adding the IMCA secretariat (imca@imca-int.com) to your internal distribution list for safety alerts and/or manually submitting information on specific incidents you consider may be relevant. All information will be anonymised or sanitised, as appropriate.

A number of other organisations issue safety flashes and similar documents which may be of interest to IMCA members. Where these are particularly relevant, these may be summarised or highlighted here. Links to known relevant websites are provided at www.imca-int.com/links Additional links should be submitted to webmaster@imca-int.com

1 Diver Injury Using Cavitation Blaster

A member has reported that a diver sustained a high pressure water injection injury whilst using a recently developed 4500 psi cavitation water blaster.

Cavitation gun

Retro jet showing proximity of nozzle to end of baffle (approx 3 cm)

During marine growth removal operations the diver released the trigger on the cavitation gun to reposition his body. When the diver reapplied pressure to the trigger, the cavitation gun kicked back towards the diver, causing the retro end of the gun to come into close proximity of his wrist and forearm. The retro jet subsequently caused a high pressure (approximately 1000 psi) seawater injection injury to the diver's forearm.

The injured diver was successfully treated with antibiotics at an onshore hospital facility and did not require surgery.

The risk assessment had not highlighted the fact that the retro jet posed a high pressure injection risk to the diver.

The incident investigation discovered that the diver had not been wearing the 11 inch long butyl rubber gloves as recommended by the system manufacturer but it was unclear if wearing these would have prevented the injury.

The manufacturer has now modified the retro jet by moving the nozzle further back inside the rear baffle. The company involved will be carrying out a full examination of the modification before allowing the cavitation blaster back into use.

Members are reminded of the IMCA guidance document AODC 049 – *Code of practice for the use of high pressure water jetting equipment by divers.*

2 Weld Failure on Kirby Morgan KM17B 505-055 Neck Clamp

A member has reported that a weld on an eight-year-old Kirby Morgan neck clamp arrangement has failed.

Kirby Morgan Dive Systems has indicated to the company that this may have been caused by either inadequate bead build-up on the weld or crevice corrosion.

In either case Kirby Morgan Dive Systems stated that underwater, this failure would not cause a catastrophic failure resulting in injury or death.

It also stated that this deficiency would be detected during the daily pre- or post-dive checks providing proper pre- and post-dive checks were being done and that there was no sure way to prevent failures of any component. However, proper maintenance and inspection would in most cases identify problems before they become dangerous.

Two relevant bulletins issued by Kirby Morgan Dive Systems in 2000 and 2003 are attached.

These notices with other safety-related information are also available on the company's website at www.kirbymorgan.com

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Maintenance & Repair Bulletin 1 of 2000: SL 17 A/B & MK 21 Neck clamp Feb. 2000

Subject:
SL 17 A/B & MK 21 Neck clamp Predive Inspection

Products Affected:
All SL 17 A/B & MK 21 Yoke/Neck Clamp Assemblies

The neck clamp assembly, like all other mechanical parts, will wear over time, thus requiring routine maintenance and eventual replacement. DSI strongly recommends that all Kirby Morgan SuperLite-17 A/B / MK 21 Neck Clamp Assemblies be carefully inspected for signs of damage and wear at least semi-annually and checked daily for proper adjustment prior to commencement of dive operations. Worn or damaged neck clamps and especially those damaged from improper adjustment pose a potentially serious safety hazard to the user. All neck clamp assemblies will eventually become worn to a point where they must be replaced. Proper routine inspection should reveal wear and damage before it becomes a danger to the user.

In April of 1999 DSI started embossing all new neck clamp assemblies with the date of manufacture and identification number. All newly manufactured neck clamps undergo inspection and testing in accordance with AWS Standard D1.1. Prior to this date, neck clamps were built to an engineering drawing and were not subjected to the ANSI/AWS standard. DSI continues to use the same engineering drawings but has additionally adopted the ANSI/AWS standard to help ensure highest quality control.

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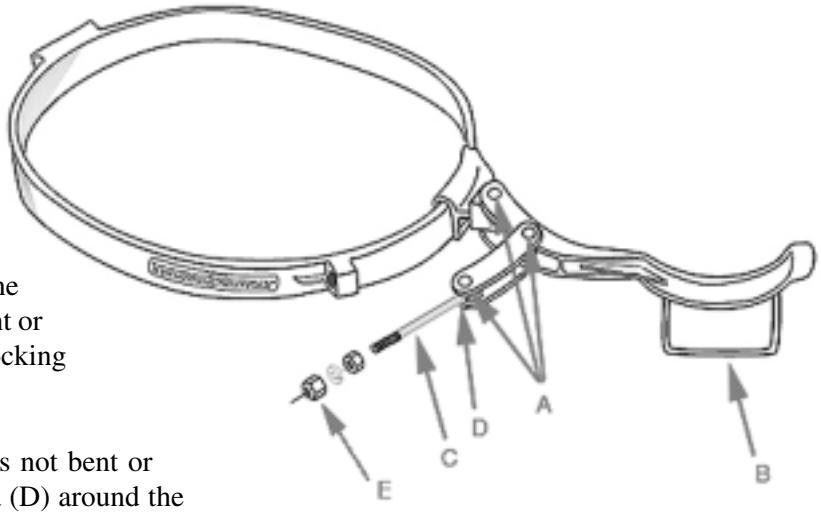
Document # 000201001

DSI recommends a maximum service life of five years for neck clamps that are used in harsh environments (i.e. welding, cutting, and burning, contaminated waters) or other practices that can degrade the metal components of the neck clamp. These clamps should be visually inspected prior to each dive as part of the pre-dive check of the helmet. This pre-dive inspection is done with the neck dam fabric/rubber in place. All neck clamps should be visually inspected at least on a semi-annual basis in detail with the neck dam fabric removed so all welds can be visually inspected for signs of cracking or damage. Neck clamps kept in service after 5 years should be inspected more frequently. Additionally, the three pins and clevis welds should be carefully inspected, as well as the adjustment stud. All metal parts should be carefully inspected for signs of wear or damage. The stainless nylon lock nut will wear out over time and will require replacement. If any other metal components appear worn or damaged the neck clamp must be replaced. This inspection is considered the minimum. The use of other non-destructive test methods such as dye penetrant testing can be used to validate suspected damage.

Neck clamp assemblies which are bent or deformed due to misadjustment or accidental damage may be returned to DSI, via your local dealer, for possible repair. Users must keep in mind that there are limits to restoring used or abused parts. DSI uses a fixture that resembles the bottom of a SL 17A/B to adjust all new neck clamps and this same fixture can often be used to reshape bent or deformed neck clamps. If there is any question regarding the condition of the neck clamp, don't use it. Suspected worn or damaged neck clamp assemblies should be taken to a DSI dealer to be sent on to DSI for a factory inspection.

The following procedure is designed to help identify degradation of neck clamp components before the degradation poses a threat to the user. It should be preformed daily before the start of dive operations or any time that the diver is changed. This is especially true if each diver does not have his or her own neck dam/yoke assembly. Diving Systems highly recommends that a neck dam/yoke assembly for each diver or at least of each neck dam size be available during dive operations with multiple divers using the same helmet. An ill fitting, wrong size neck dam can pose a serious hazzard to the diver. Also, a backup neck dam yoke assembly is insurance against down time due to a damaged neck clamp.

Neck Clamp and Yoke Assembly Pre-Dive Inspection: (Refer to the illustrations for reference).



Visually inspect the moving parts of the clamp assembly including the three pins (A) in the over-center lever assembly, and the three clevis blocks. Visually inspect for bent or broken pins or a bent or broken handle and locking bail (B).

Check to ensure the adjustment stud (C) is not bent or damaged. Visually inspect the welded area (D) around the base of the stud for signs of stress or weld cracking.

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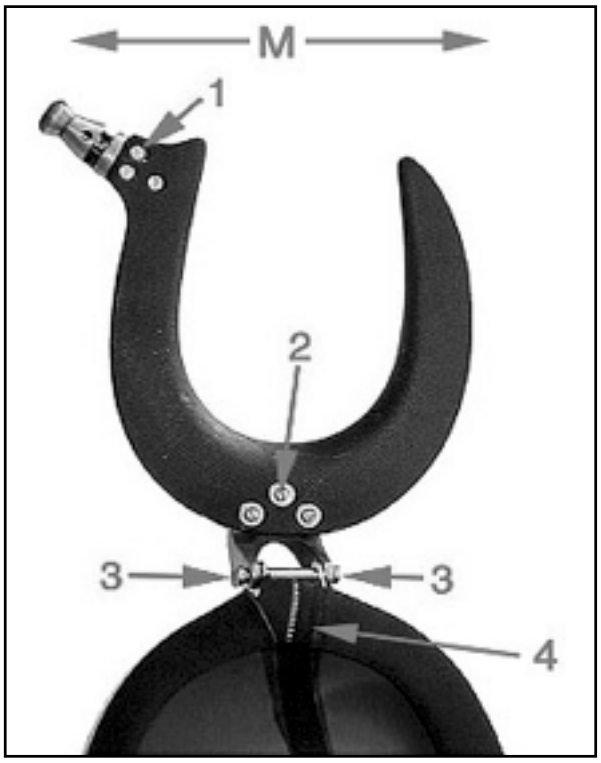
On the Yoke, check that the screws (1) holding the Latch Catch Assembly are tight. Check to ensure the latch catch mechanism functions smoothly. Ensure the safety pin is present and attached by a lanyard.

Check to make sure the rear hinge tab is secured tightly to the clamp foundation. This can be checked by wiggling the yoke back and forth sideways (M) to ensure it and the hinge are securely tightened to the hinge tab and the hinge tab is secured to the clamp. If there is a slop in this movement, first check to ensure the brass hinge is firmly attached to the yoke assembly (2) and the two bolts (3) are installed securely to the brass hinge. If these are tight, the hinge tab to clamp screws may be loose. To tighten these screws you must remove the two bolts (3) holding the brass hinge to the clamp and remove the yoke & hinge from the clamp. The screws may be accessed by pushing the neck dam neoprene (4) to the side. After tightening the screws, remount the yoke & hinge using the two bolts. You must use Locktite® on the bolts (3) when reinstalling them.

Check the condition of the neoprene or rubber neck dam for wear and deterioration, replace if necessary.

Check fit and adjustment of the neck clamp by installing the clamp on the helmet, ensuring that the clamp is seated properly over the o-ring area of the helmet. When closing the lever, the lever should get tight at the mid-point of travel, and once the lever is past the mid-point of travel, the clamp should close easily. DO NOT FORCE THE CLAMP SHUT! If it does not close as described, you MUST adjust the clamp by loosening the adjustment locking nut (E). From the closed position if you pull out on the lever approximately 1-2 inches, the lever should snap closed when released.

As the neck dam ages it compresses and the clamp must be adjusted by tightening the adjustment locking nut (E) so that the clamp operates as described above.



The stainless steel nylon lock nut (E) will require periodic replacement as the nylon insert wears out due to the periodic adjustments to the clamp that MUST be made as the neck dam ages or you change to a dry suit mount. YOU SHOULD NEVER HAVE TO FORCE THE CLAMP SHUT!

Proper adjustment of the neck clamp should place the bail squarely in the groove of the latch catch body when the clamp is closed.

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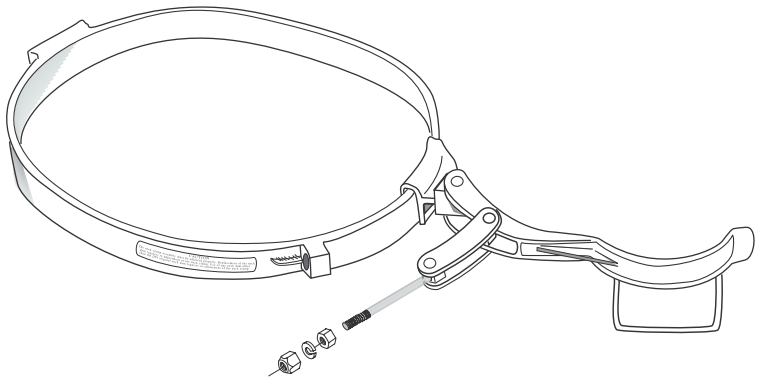
Safety Notice 1 of 2003:
SL 17 A/B & MK 21 Neck clamp
28 Aug. 2003

Subject: Neck Clamp Assembly
KMDSI Part # 505-055 (and pre '89 505-003)

Products Affected: Kirby Morgan SuperLite-17A/B & U.S. Navy MK-21 Mod. O & Mod. I Helmets



Kirby Morgan Dive Systems, Inc. (KMDSI) was alerted by its Authorized Dealer in Southern Africa about the following incident: A Kirby Morgan SuperLite 17A/B (Serial #82929, purchased in April 1997) neck clamp assembly was found jammed in a container door. The neck clamp was hanging on the umbilical rack on the door and the person closing the container door did not notice that it was jammed. When the jammed neck clamp was discovered, it was removed and closely inspected. During the clamping process (onto the helmet) one of the welded pins on the neck clamp assembly broke off. On closer inspection it was noted that there was no way of identifying this potential break as both sides of the pin are welded.

It is important that a visual inspection of the neck clamp assembly be done before every dive. Normal inspection of the neck clamp assembly is covered in the Kirby Morgan Daily Pre-Dive inspection Appendixes A2.3, Monthly Inspection A2.2 and the Annual / 400 Hour Overhaul A2.1. These Appendixes can be found at <http://www.kirbymorgan.com/>www.kirbymorgan.com under notices/maintenance checklists.

The Annual/400 hour Overhaul has the technician remove the clamp from the yoke and neck dam so that all the component surfaces are revealed for inspection. The monthly Inspection check has the technician checking all welds and checking the entire clamp adjustment stud by loosening the lock nut and exposing the entire stud. This check is not as complete as the annual but is considered adequate if done monthly. Neck clamps older than five years should be inspected weekly in accordance with Appendix A2.2 steps 1-6 and daily in accordance with Appendix A2.3 Daily Pre-Dive Set up and Inspection steps 1.1-1.2. Anytime neck clamps are used on different helmets the neck clamp must be checked for proper function, fit and adjustment prior to diving.

KIRBY MORGAN® Genuine Parts

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Over the years, KMDSI has upgraded and enhanced the SuperLite® 17 A/B, MK 21 neck clamp assembly. Enhancements include not only more stringent inspections, but reinforcements in critical areas as well as changing materials to aid in the reduction of oxidizing. Since April, 1999 KMDSI has inscribed every SuperLite® 17 A/B, MK21 neck clamp with date of manufacture and an identification number.

April 2004 will be five years since the inception of inscribed neck clamps. If your neck clamp is not inscribed, it is older than five years and KMDSI strongly recommends that the neck clamp be inspected on a weekly basis in accordance with SuperLite 17 A/B monthly helmet inspection Appendix A2.2 procedures 1 – 6.

Any Neck Clamp Assembly that does not pass inspection and is not repairable should be destroyed so that there is no chance of it being used by accident or negligence.

This inspection sheet as well as all Kirby Morgan helmet and masks inspection and maintenance check lists can be found on our web site http://www.kirbymorgan.com/ under notices/maintenance checklists.

If any part doesn't look right, don't use it.

All metal parts should be inspected for cracks or corrosion and replaced immediately if this type of damage is found. While some surface rust or corrosion is to be expected, severe corrosion can lead to the eventual failure of the part.

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