

To all those who use and take care of NK products:

Nielsen-Kellerman equipment is designed, built and tested to withstand the rigors of everyday use, but it is NOT invincible and it can be damaged. In the hands of an uneducated user the equipment can be harmed. The following information is intended to help users maintain their equipment and perform minor repairs.

Regular Maintenance Tips:

Once a month

1. Once a month apply silicone to the outside of the rubber plug on the Cox-Box (CB) or Cox-Vox (CV) This also applies to those individuals who use the CB/CV jumper, which NK strongly recommends. This helps to minimize the damage done by repeatedly removing the CB/CV/SC from the boat. (Try not to get the Silicone into the plug.)
2. Once a month apply Nyogel (available from NK) to the pins of the mating rubber plug of the harness using the applicator syringe provided. Plug the harness in and out a few times. (Make sure that the plug is clean and free of debris prior to applying Nyogel.) This will coat the pins with Nyogel and push some Nyogel into the sockets protecting them as well.

Daily

1. Inspect the toggle-switch seal for integrity (see Toggle switch Inspection). Especially important if you row in salt water and wash your unit regularly.
2. Just slip the microphone bayonet on the CB/CV panel jack and DO NOT tighten it fully.
3. If you row in SALT WATER rinse the CB/CV off with fresh water and dry it after every use.
4. Place the unit on charge whenever it is NOT in use, but do not leave the unit on charge indefinitely. The unit should never be charged for longer than 3 days.

At the end of the season

1. Clean the unit with fresh water and dry it carefully, remembering to inspect the toggle switch seal before washing the unit.
2. Apply silicone to the outside of the rubber plug on the CB/CV.
3. Apply Nyogel to the pins of the mating rubber plug of the harness using the applicator syringe provided. Plug the harness in and out a few times. (Make sure that the plug is clean and free of debris prior to applying Nyogel.) This will coat the pins with Nyogel and push some Nyogel into the sockets protecting them as well.
4. Fully charge the CB/CV and then store it turned off in a cool, dry place.

Charging your CB/CV/SC

- Do place the unit on charge WHENEVER it is not in use, but do not leave the unit on charge indefinitely. The unit should never be charged continuously for longer than 3 days.
- Do charge the unit when the low battery light is on. Charge it for at least 12 hours before using it again.
- (A fully charged battery should last at least 5 hours.)
- Do not continue to use a unit with the low battery warning light illuminated. Repeat use of the CB/CV with the low battery light on will damage the batteries and may damage the unit. Repairs for the CB/CV are expensive (a minimum of \$115.00)
- Do not allow the unit to get hot. Leaving it in a closed vehicle in the sun is certain to damage the battery.

Is my charger working correctly?

- A normal charger will be vary warm after less than one hour's use.
- If the charger is not warm then it is not operating correctly
- Chargers can be warm, but still not working.
- Correctly working chargers will also cause the charging light to illuminate on the CB/CV display.

Our chargers are rated 12VDC and 300 mA and are sent to the user with a special plug attached. We recommend that all

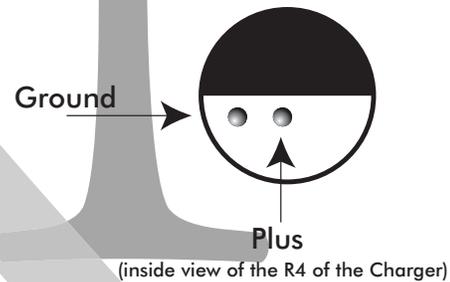
chargers be purchased from NK, and that you do not purchase elsewhere.

If you suspect that your charger is not working correctly you can either perform the following test, or you can send the charger back to NK to be tested.

Batteries need to be replaced every three years.

Testing your charger:

Obtain a multimeter - almost any type will do. Turn the multimeter on and set it at 20VDC. After plugging the charger in (be very careful the charger is on) place the positive lead from the multimeter on the plus pin, and the negative lead from the multimeter on the ground pin. The multimeter should read between 13.5V and 15V. Any large deviation from this range indicates that the charger is not working correctly.



Trouble shooting your charger:

If the charger is not working correctly it is probably that one of the pins has become disconnected or misaligned. Usually the pins become misaligned due to debris in the plug, therefore it is important to keep the plugs clean and free of debris.

It is possible to replace/repair the pins yourself, NK supplies spare pins and instructions on how to change them. If you do not want to replace the pins yourself you can send the charger to NK and we will repair it for you.

The toggle switch seal.

The CB/CV are tested under partial vacuum for seal integrity during manufacturing and after all repairs. After several years of use, the gray rubber seal for the toggle switch may crack, tear, or just loose its ability to properly seal the switch. If this happens, the watertight sealing of the CB/CV will be compromised and it is likely that water will enter the unit through the seal. In cases of severe damage to the seal, it is possible to damage the unit seriously.

We recommend that the seal is regularly examined for any signs of splitting or tearing, or incomplete sealing around the toggle lever when it is moved to extreme positions. If such damage is noticed, the unit should be returned to NK for replacement of the switch seal, before water can enter the unit and cause extensive damage.

Microphones:

Your microphone is shipped attached to a headband and ready for use. The microphone is fully waterproof, and may be fully immersed, but it will not float on its own. Unless it is attached to a CB/CV the microphone will sink! The mouthpiece end of the microphone is protected from water by a semi-permeable membrane.

CAUTION!

Microphones should be treated with care. Microphones are damaged more often by coxswains, crew and coaches than any other piece of equipment.

Do Not attempt to bend the aluminum boom

Do Not twist the mouthpiece

Do Not drop the microphone

Do Not yank the microphone cable

Do Not pull on the cable when removing the microphone from the CB/CV

Do Not tighten the bayonet connector on the microphone to the panel jack on the CB/CV. Just slip it in place
Do Not carry the CB/CV around by the microphone.

The Warranty covers defects in materials and workmanship. It DOES NOT cover damage caused by abuse, misuse, or attempts to repair the microphone yourself.

Care of the Rubber Plugs

The rubber plugs of the CB/CV or the harnesses can be damaged with improper care.

Do Not use Vaseline on the rubber plugs ever. Vaseline will cause the rubber plug to deteriorate.

Do Not apply Nyogel to the rubber plugs. It too will cause the rubber plug to deteriorate. Nyogel is only intended to be used on the metal pins inside the plugs.

Do apply Silicone to the outside of the rubber plug of the CB/CV. This will extend the life of your plug and CB/CV.

CB/CV Troubleshooting

CB/CV will not hold a charge:

Usually the CB/CV will hold a charge, it is that it is not being charged correctly.

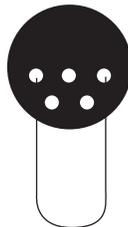
- a) Always place the unit on charge WHENEVER it is not in use, but so not leave the unit on charge indefinitely. The unit should never be charged continuously for longer than 3 days.
- b) Always charge a unit that has an illuminated low battery light for AT LEAST 12 hours before using it again. (A fully charged battery should last at least 5 hours)
- c) DO NOT continue to use a unit with the low battery warning light illuminated. Repeated use of the CB/CV with the low battery light on will damage the batteries and may damage the unit. Repair for the CB/CV are EXPENSIVE (minimum \$115.00).
- d) DO NOT allow the unit to get hot. Leaving it in a closed vehicle in the sun is certain to damage the battery.

Irregular (or no) stroke reading:

Frequently the sensor and NOT the CB/CV cause this problem

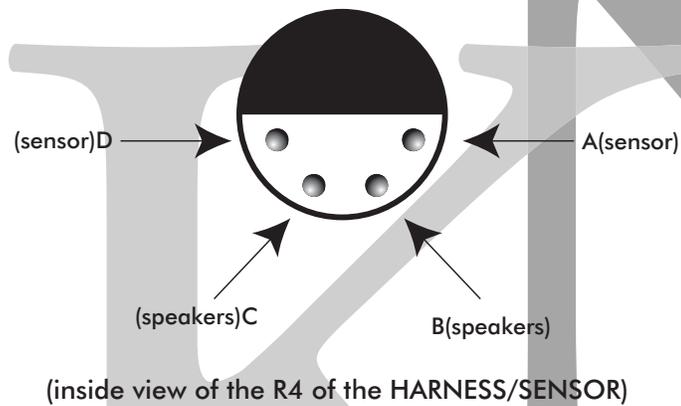
TESTING THE UNIT

- a) Turn the unit on, clear the memory, and put in ready mode.
- b) Using a pair of tweezers or a bent paper clip (folded into the shape of a "u")
- c) Repeatedly poke the "u" into the two exterior holes of the CB/CV plug. (See picture below)



- d) The CB/CV stroke rate should update every other poke. If the CB/CV updates regularly the problem is with the sensor.
- e) If the CB/CV does NOT update regularly check the sockets to see if they are at recessed to the same height. Recessed sockets may cause problems, as well as dirt or debris imbedded in the sockets.

CHECKING THE WIRING



- a) The user should also check wiring for the following:
 - i. All the pins are properly installed on the R4
 - ii. The wiring is free of cuts and or knicks
 - iii. Are the sensor and seat magnet secured and properly positioned.
- b) Test the sensor with a multimeter:
 - i. Set the multimeter to Ohms (any range)
 - ii. Typically you will have to remove the pins labeled 'A' and 'D' from the R4 (but it is possible to reach them while still in the R4). Connect the Multimeter to 'A' and 'D'.
 - iii. Slide a magnet over the seat sensor. You should see open (typically a 1)/ short (typically a 0) alternating on the multimeter. If you do NOT see this oscillation you will need to order a new seat sensor from NK.
- c) If after cleaning the sockets and checking the wiring the unit still does not work, please send it to NK to be repaired.

Audio Problems:

Checking the Unit

- a) Check the wiring for cuts or knicks.
- b) Are all the connectors (pins, sockets, plugs, receptacles) properly positioned (see figure above)

Testing the Unit

- a) Swap out components one at a time to narrow down the problem. (ex. Replace the microphone with a known good microphone, then replace the speakers one at a time etc)
- b) Using known to be good parts you can isolate the problem into one of four categories
 - i. CoxBox
 - ii. Microphone
 - iii. Wiring
 - iv. Speakers

NEVER ATTEMPT TO REPAIR THE CB/CV UNIT YOURSELF!!!!

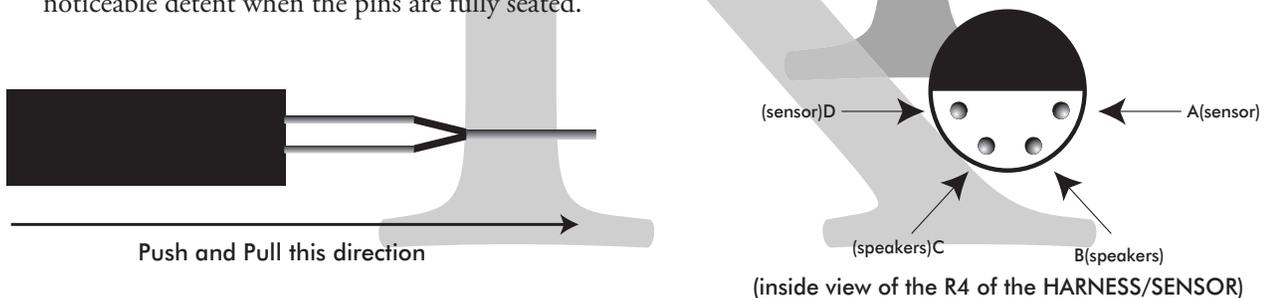
This voids the warranty and often causes very expensive damage.

Removal of old seat sensor

Tools required:

- Needle nose pliers
- Small flat head screw driver (2 mm wide)

- 1) Locate the 4-pin rubber receptacle (R4) which mates with the 5-hole plug on the CB/CV front panel. The receptacle is normally in the shell and connects the wiring harness to the CB/CV.
- 2) Carefully push the stroke pins out of the R4. They are the pins labeled 'A' and 'D' (be careful not to damage the two other pins labeled 'B' and 'C')
- 3) Apply Nyogel to the new pins and to the holes into which the pins are to be inserted. It does NOT matter which pin is inserted into which hole.
- 4) Use pliers to position new seat sensor pins into holes 'A' and 'D'.
- 5) Use a VERY small slotted (flat-headed) screwdriver to push the pins into the R4. The new pins should be even with the existing audio pins ('B' and 'C'). DO NOT pull the pins into the plug as this will damage the pins, the plug, and possible the soldered connection point. Use the small screwdriver and carefully poke the pins home. There is a noticeable detent when the pins are fully seated.



Changing PINS on harnesses and sensors

Tools Required:

- Crimping Tool (pliers acceptable)
- Soldering Iron (if you are replacing the pins)
- Needle Nose pliers
- Nyogel
- Small flat head screw driver (2 mm wide)
- Wire stripper

Slots 'A' and 'D' are for the sensor
Slots 'B' and 'C' are for the speakers

- 1) Locate the 4-pin rubber receptacle (R4) which mates with the 5-hole plug on the CB/CV front panel. The receptacle is normally in the shell and connects the wiring harness to the CB/CV.
- 2) Identify the two pins 'A' and 'D' (see figure above) attached to the stroke sensor and PUSH them out in the direction shown below (see figure above) using the needle nose pliers.
- 3) Once the pins have been pushed as far as they will go, pull on the sensor lead until the pins come free from the plug.
- 4) Cut off the old pins and strip the wire ¼". The stripped wire must be clean or it will not accept solder.
- 5) Crimp the pins onto the wire and solder them in place.
- 6) Apply Nyogel to the new pins and to the holes into which the pins are to be inserted.
- 7) Use the pliers to push the pins into the receptacle as far as they will go.
- 8) Use a VERY small slotted (flat-headed) screwdriver to push the pins into the R4. The new pins should be even with the existing audio pins ('B' and 'C'). DO NOT pull the pins into the plug, as this will damage the pins, the plug, and possible the soldered connection point. Use the small screwdriver and carefully poke the pins home. There is a noticeable detent when the pins are fully seated.