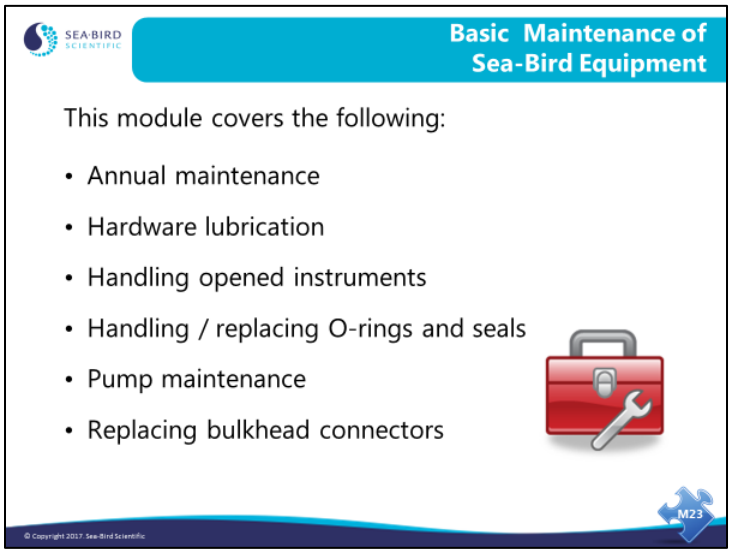
SEA-BIRD SCIENTIFIC

Maintenance

Sea-Bird Scientific University Module 23

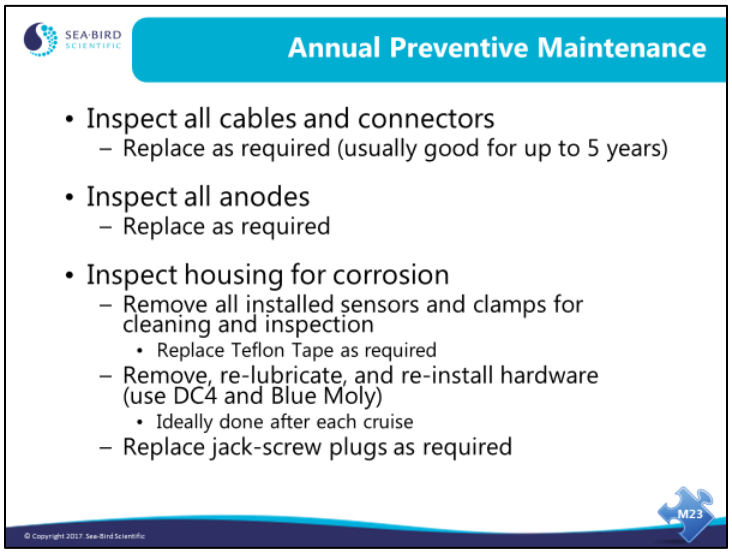
Overview



We are going to discuss how to perform basic maintenance on your Sea-Bird equipment in this module.

Of all of the maintenance that can be performed, the most crucial is cleaning, which we discussed in the previous module.

Annual Maintenance



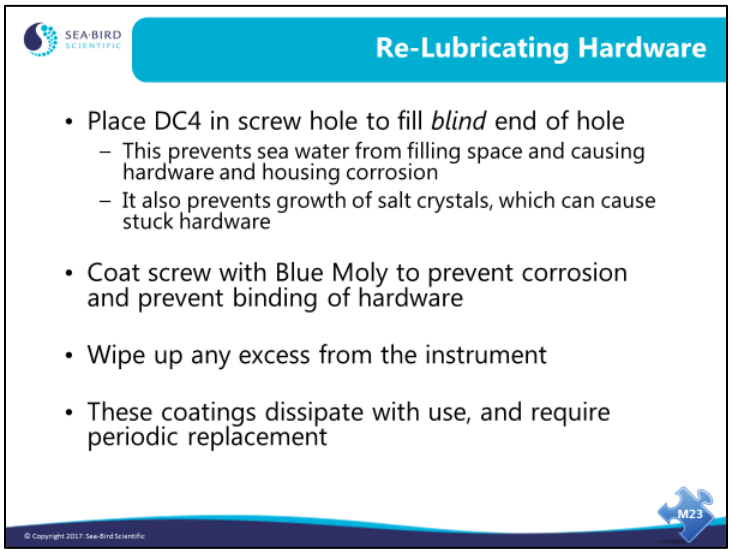
Inspect cables for cuts, abrasions, cracking, and corrosion. Sea-Bird recommends that you replace *worn* cables, even if they are still functional (save working cables as spares).

For anodes, Sea-Bird recommends that you replace them when more than 50% of the material has eroded.

Minor exterior housing corrosion (pits) can be *patched* to extend housing life. Keep in mind that patching is not a *cure*; once corrosion has started it will continue.

- Remove loose oxide.
- Clean and dry with alcohol.
- Apply a light coat of epoxy.

Lubricating Hardware



- DC-4 is a silicone-based electrical insulating compound.

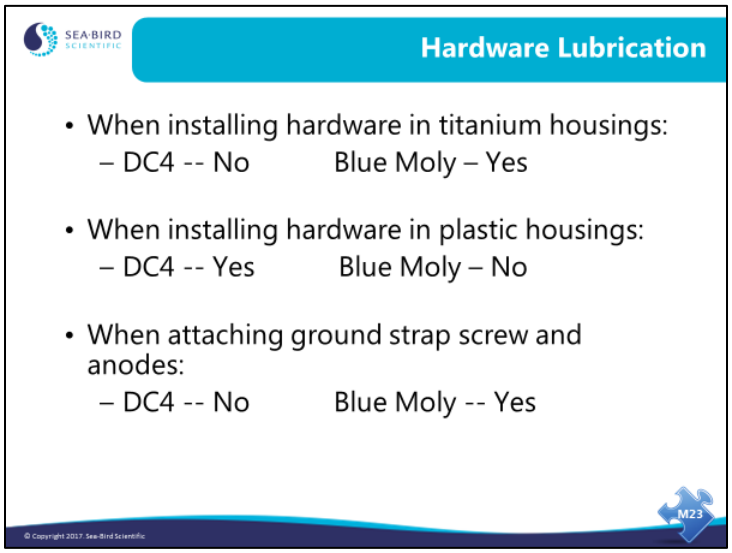
- Never-Seez® Blue Moly is a lubricating and anti-seize compound containing molybdenum sulfide, nickel, and zinc oxide.

- Never use copper-based anti-seize products.

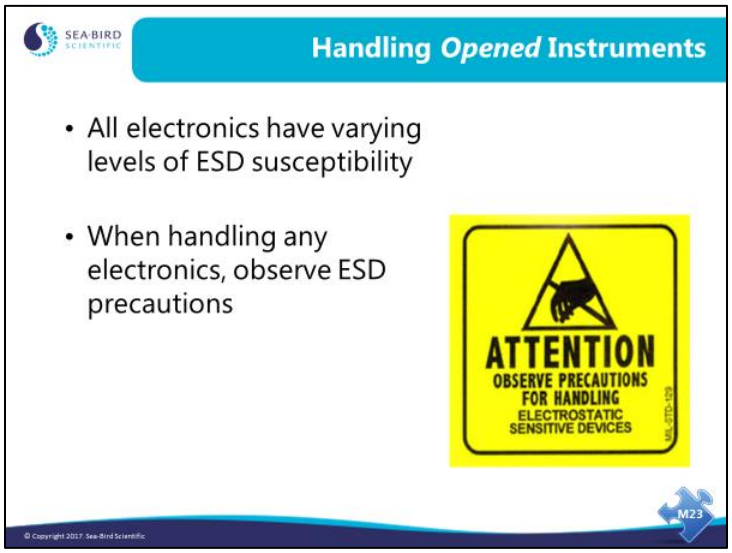
- A hypodermic syringe is the easiest way to apply the DC-4 to the screw holes.

- You may want to wear latex gloves when applying Blue Moly.

Lubricating Hardware *(continued)*

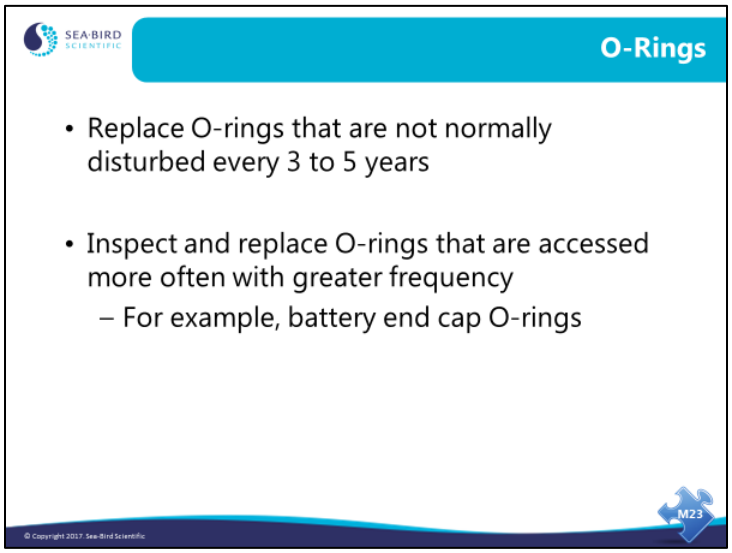


Electrostatic Discharge Precautions



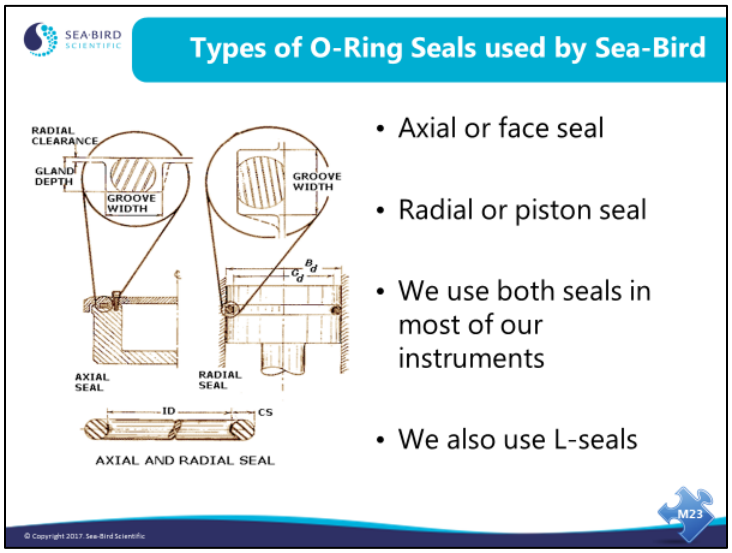
- Avoid wearing rubber-soled shoes.
- Avoid scuffing (sliding) your feet on carpeted surfaces.
- Discharge yourself by touching a grounded object.
- Use antistatic devices, such as wrist straps and floor mats.

O-Rings and Seals



The O-rings in your instrument are one of the least expensive, yet most important, components.

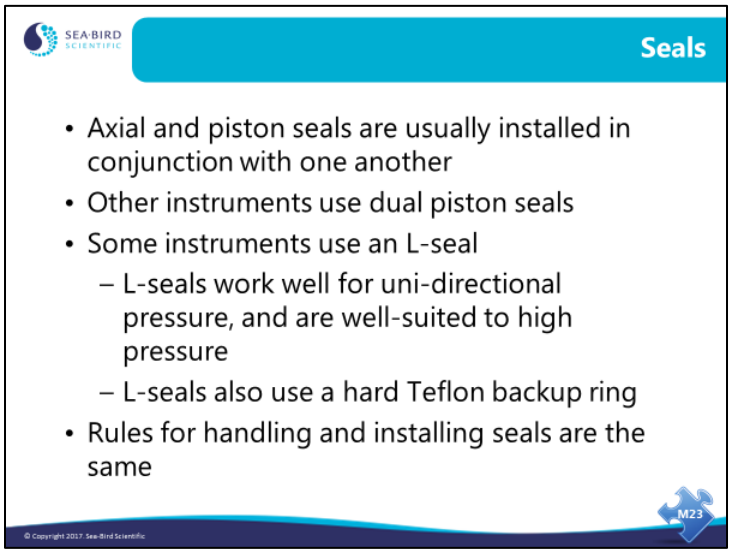
O-Rings and Seals *(continued)*



The face seal and piston seal are used in conjunction with each other on the battery end cap.

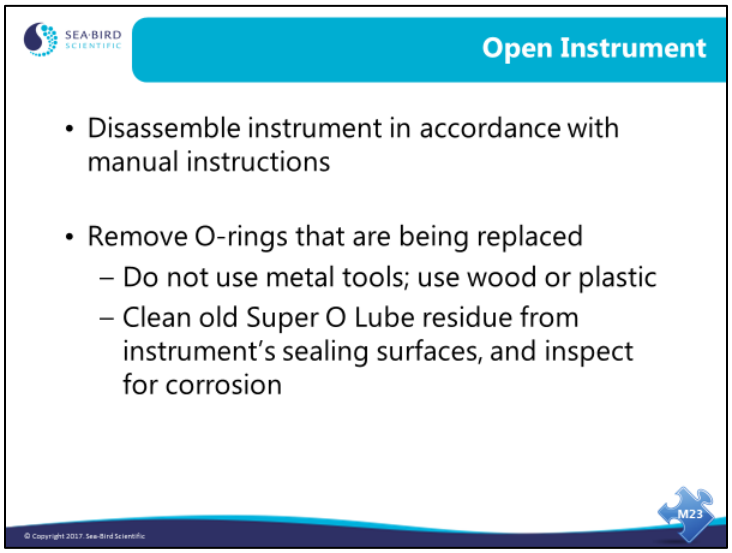
We also use Morrison seals to install temperature probes in our end caps.

O-Rings and Seals *(continued)*



- Keep clean.
- Store in sealed bags, out of direct sunlight.
- Inspect thoroughly before installation.
- Lubricate lightly.

O-Rings and Seals – Opening Instruments

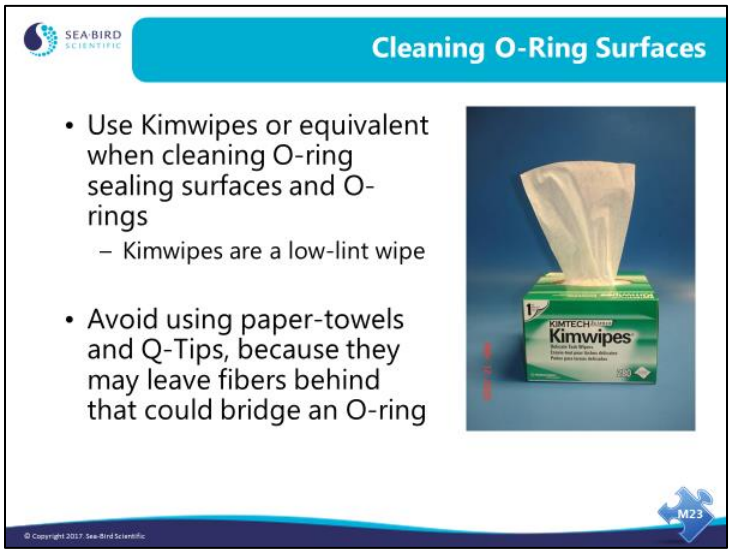


Make sure the instrument is completely dry before opening. **Water on the electronic circuits can severely damage the instrument.**

- Water droplets *hide* behind conductivity cells.
- Dry around O-rings before fully opening the instrument.

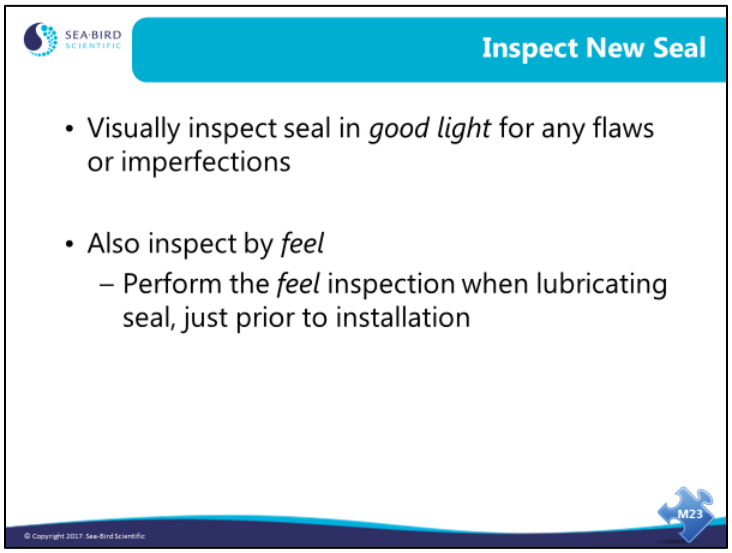
Alcohol can be used to clean stubborn O-ring lubricant.

O-Rings and Seals – Cleaning Surfaces

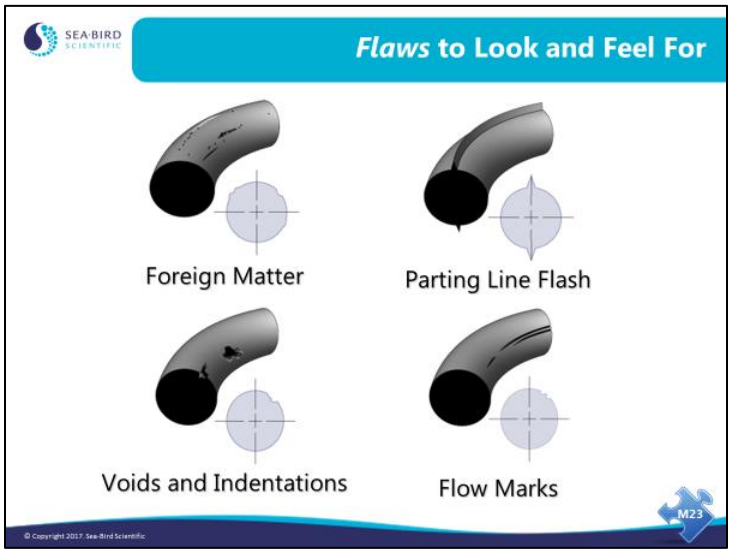


Having clean surfaces is one of the most important aspects of O-ring handling and replacement.

O-Rings and Seals – Inspecting

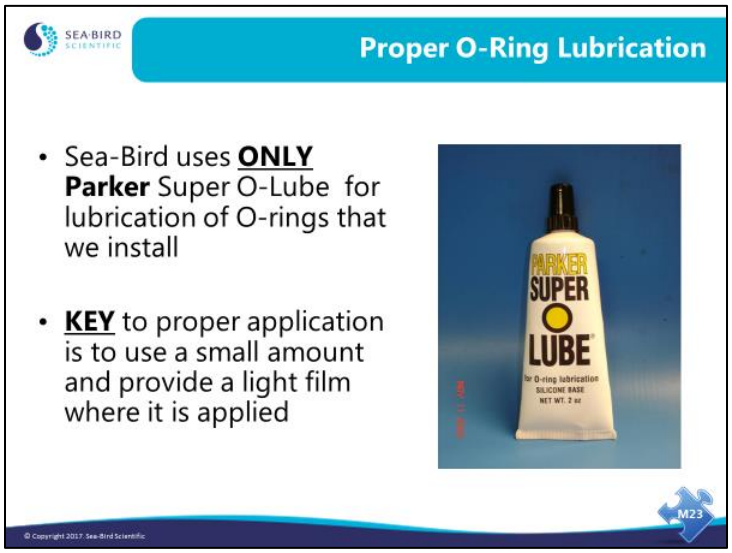


O-Rings and Seals – Typical Flaws



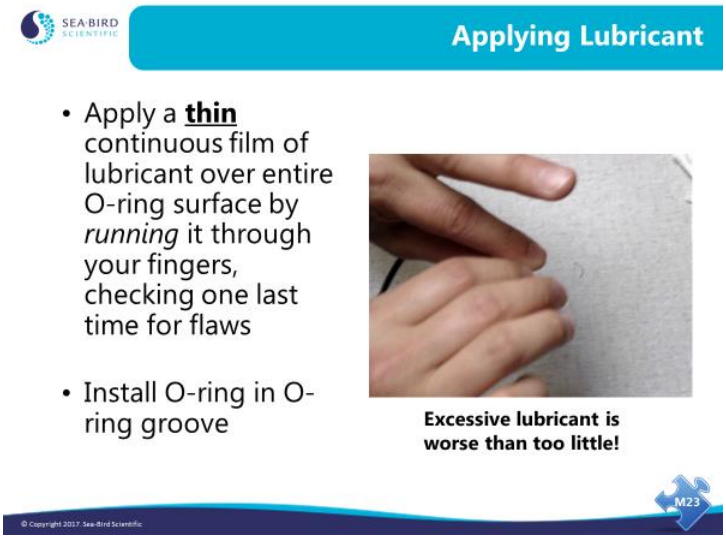
Any of these flaws may result in the instrument flooding.

O-Rings and Seals – Lubrication



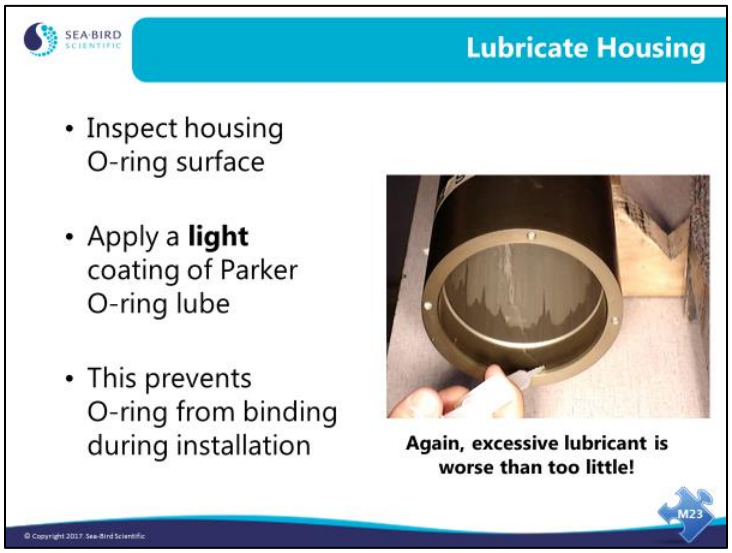
Do not use Parker O-Lube, which is petroleum based; use only Parker *Super* O-Lube.

O-Rings and Seals – Lubrication *(continued)*



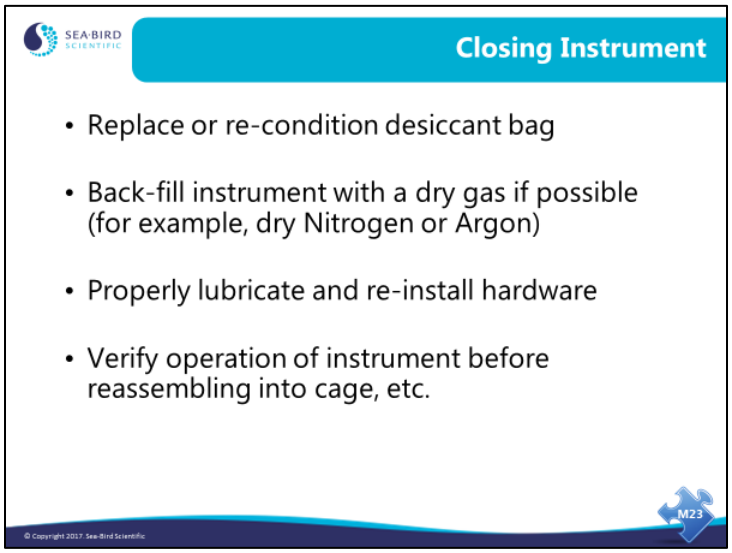
The lubricant on your finger tips will actually enhance your ability to detect flaws in the O-ring.

O-Rings and Seals – Lubrication *(continued)*



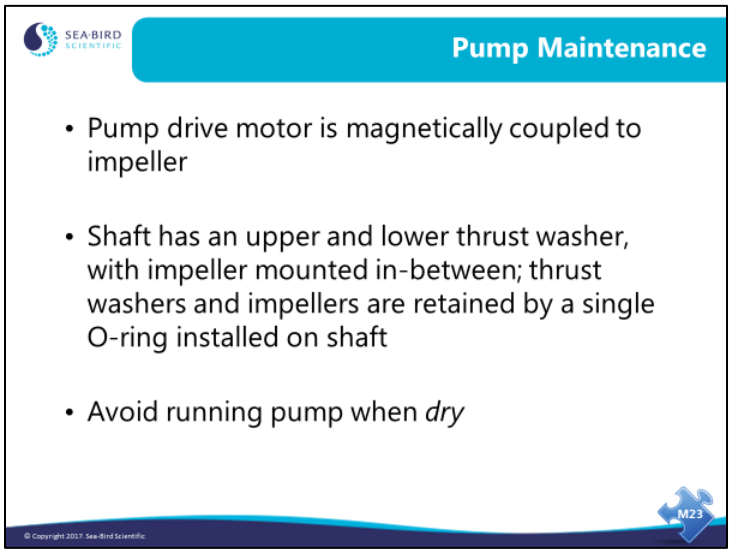
Inspect for pits, scratches, corrosion, and foreign matter.

O-Rings and Seals – Closing Instruments



See Application Note 71: Desiccant Use and Regeneration (www.seabird.com/document/an71-desiccant-use-and-regeneration-drying) on our website.

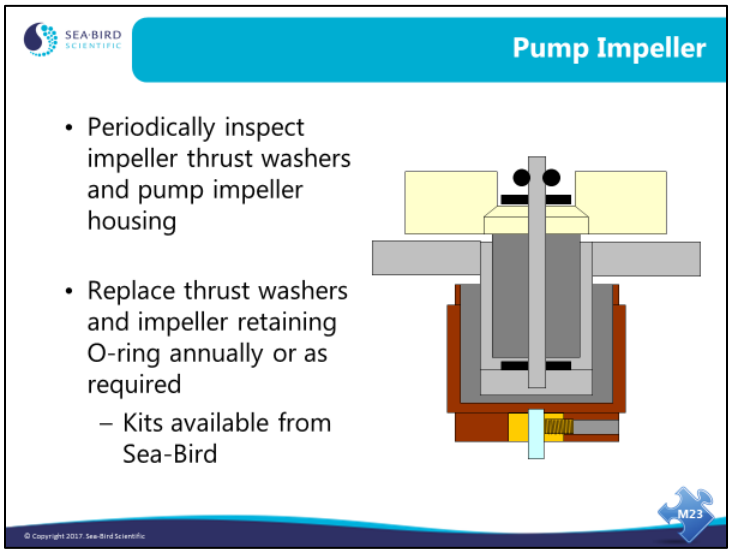
Pump Maintenance



On our website, see –

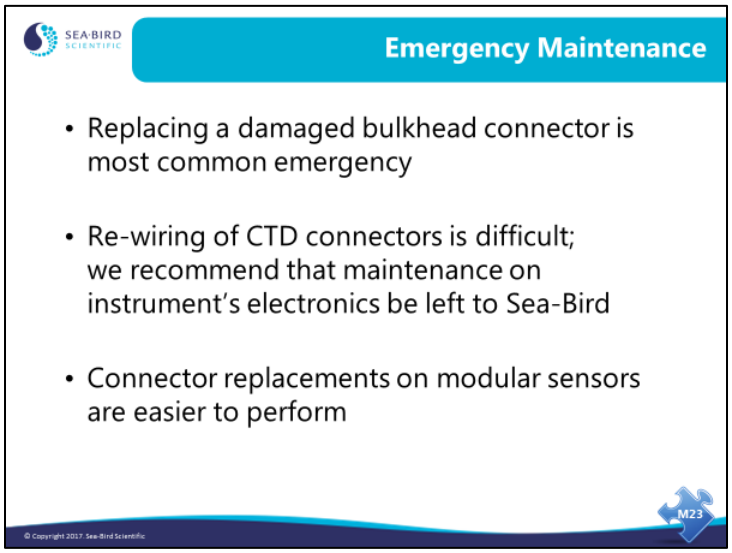
- Training video (www.seabird.com/sbe-5t-pump-maintenance)
- *Application Note 75: Maintenance of SBE 5T, 5P, and 5M Pumps* (www.seabird.com/document/an75-maintenance-sbe-5t-5p-and-5m-pumps).

Pump Maintenance *(continued)*



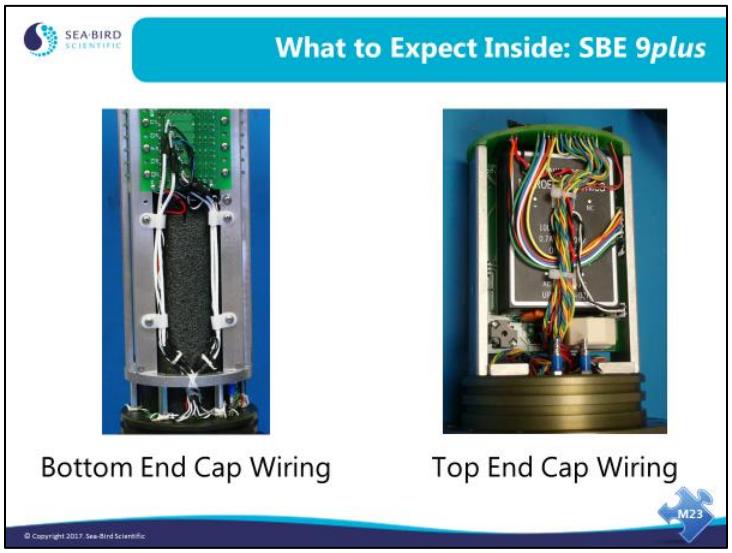
There is a grove for the impeller retaining O-ring in the tip of the shaft. Push down with your fingertip until the ring slips into the groove.

Replacing Bulkhead Connectors



As electronics have become more and more miniaturized, it is difficult to perform board level repairs without specialized tools.

SBE 9*plus* Bulkhead Connector Wiring

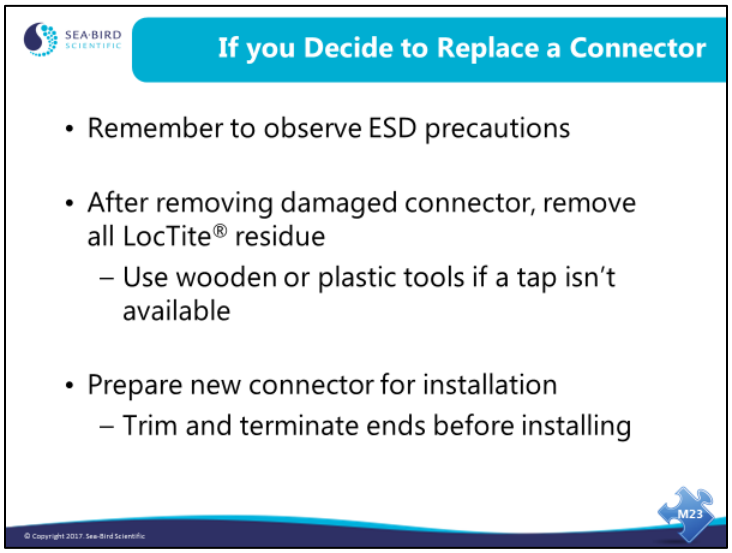


Note that the wiring from all of the connectors joins together to form large bundles.

SBE 16*plus* and 19*plus* Bulkhead Connector Wiring

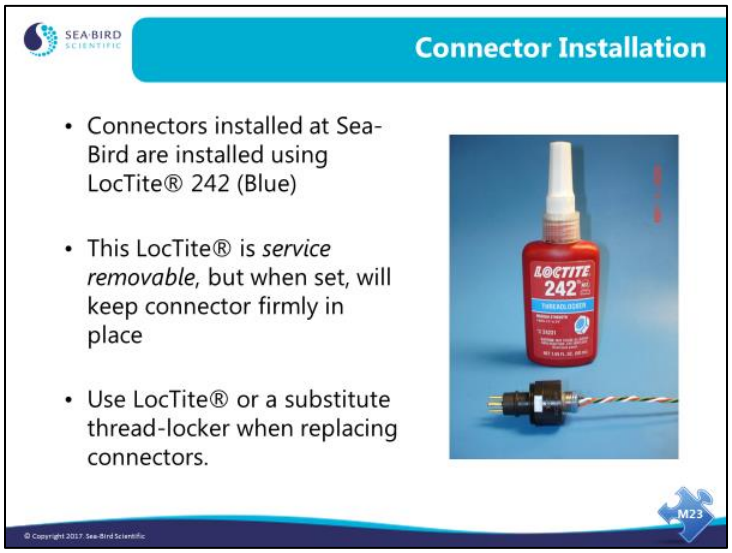
The leads solder directly to the motherboard.

Replacing Bulkhead Connectors



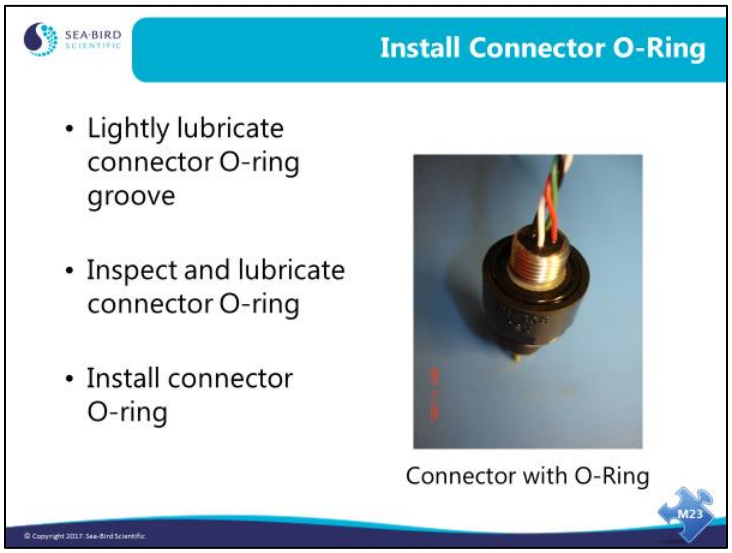
- The connectors use a ½"-20 thread.
- Never use metal tools around the O-ring surfaces.
- It is best if the ends of the replacement connectors leads are trimmed and tinned prior to installation.

Replacing Bulkhead Connectors *(continued)*



If you use a substitute thread-locker, make sure that it indicates that it is *service removable* and is rated for ½" hardware.

Replacing Bulkhead Connectors *(continued)*



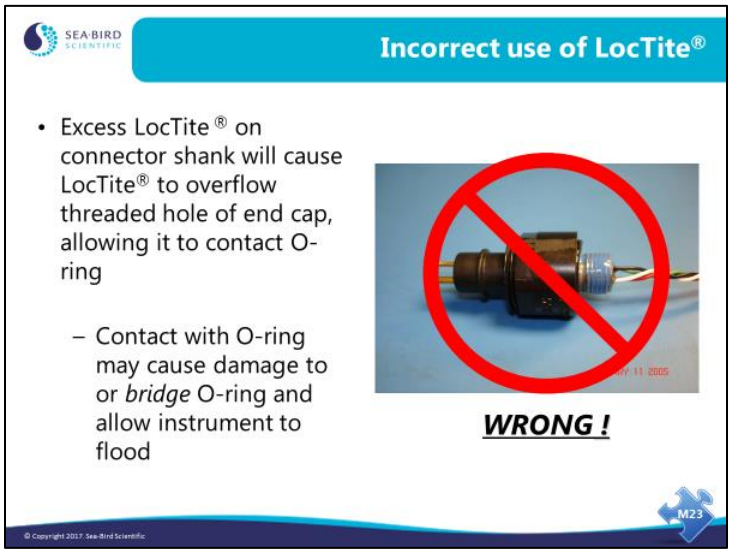
Remember: Only very light lubrication is required!

Replacing Bulkhead Connectors *(continued)*

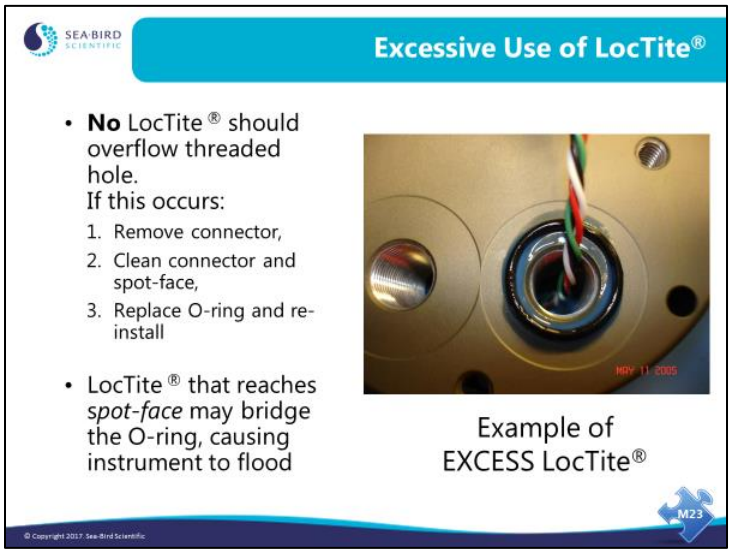
You should stop seeing LocTite® move up the threads when there are approximately two full threads remaining on the connector.

Replacing Bulkhead Connectors *(continued)*

Replacing Bulkhead Connectors *(continued)*



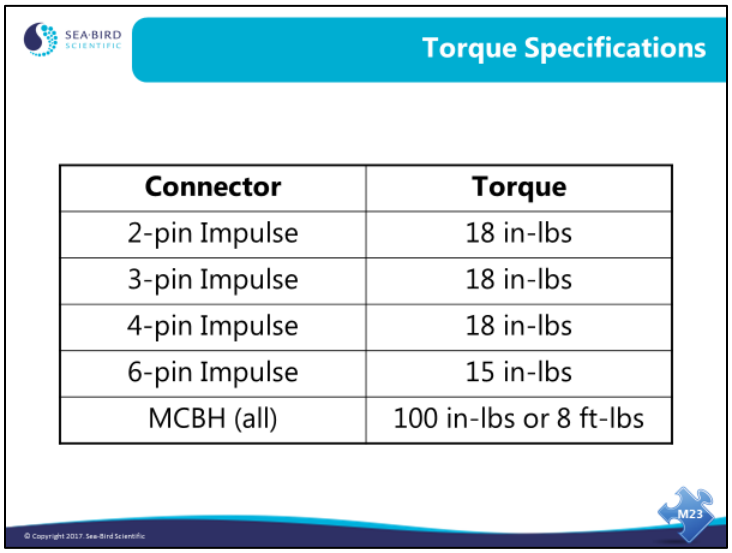
Replacing Bulkhead Connectors *(continued)*



Replacing Bulkhead Connectors *(continued)*

- If you do not have access to a torque wrench in the correct range, tighten the connector a little past *snug*.
- Do not over-tighten, as damage to the connector may occur.
- Allow the LocTite® to cure for 12 to 24 hours.

Replacing Bulkhead Connectors *(continued)*



Impulse connectors are our *standard* connectors. MCBH connectors are wet-pluggable connectors, and are optional on all of our instruments.