Gauge Assembly and Maintenance
(Part 2 of 2)

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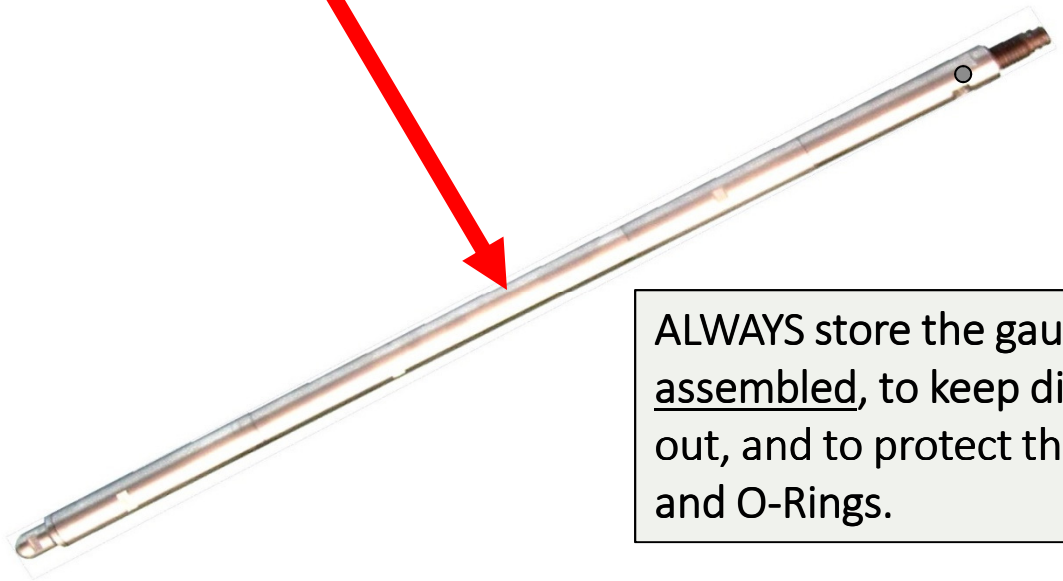
WARNINGS!

ALWAYS Store the Gauge Completely Assembled

NEVER store a Battery Pack inside the gauge if it is not being used for a job.



ALWAYS store the gauge completely assembled, to keep dirt and moisture out, and to protect the gauge threads and O-Rings.

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NEVER DISASSEMBLE THE OWR SECTION!

NEVER disassemble the internal parts of the **OWR SECTION**.

There are NO "User Serviceable Parts" inside the OWR SECTION (the section with the Gauge S/N scribed on it).

If you disassemble the OWR SECTION …

- The material used for packing the electronics will spill out, and you will NOT be able to repack it properly.
- If this internal packing material gets on the gauge threads, it could seriously damage them!
- You would have to ship the gauge back to IES for repair.

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NEVER DISASSEMBLE THE OWR SECTION!

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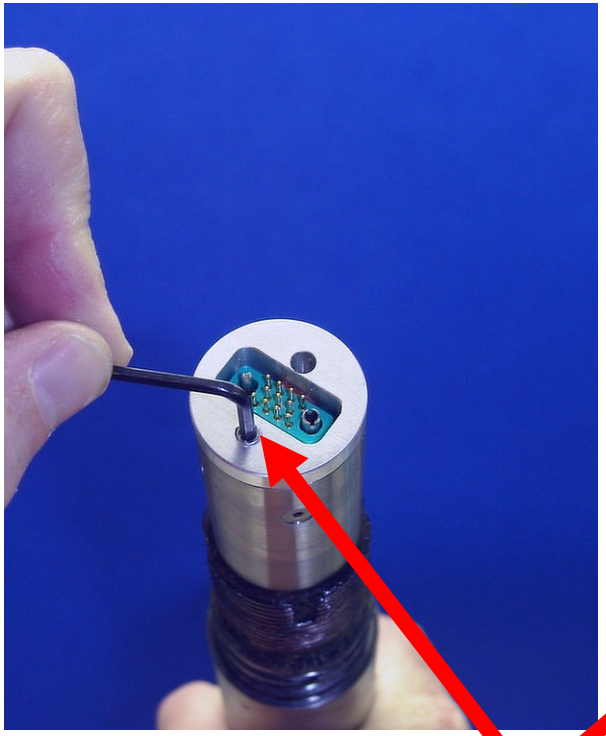

NEVER remove or loosen these screws on the OWR SECTION

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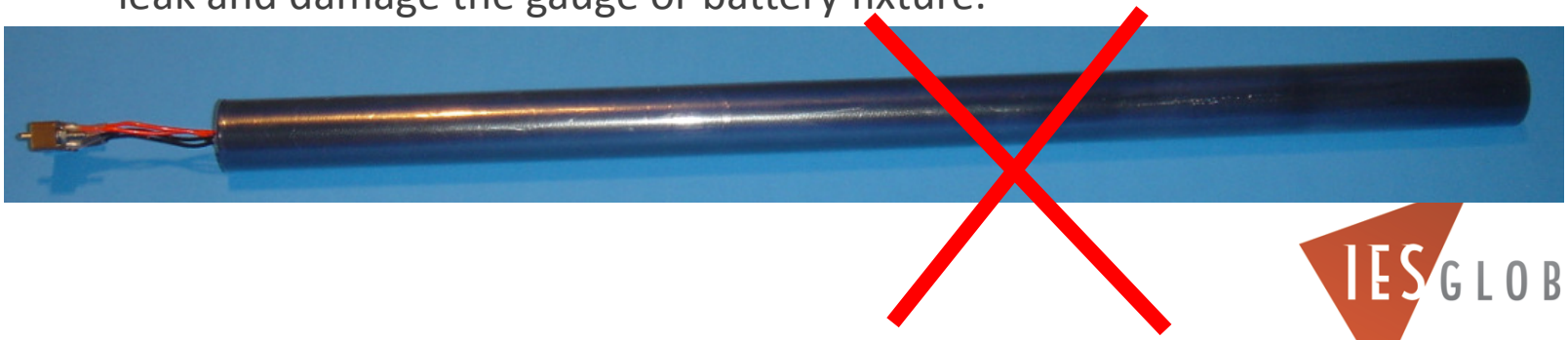
Gauge Maintenance Steps after EVERY Job

Gauge Maintenance Steps after EVERY Job!

After EVERY Job…

1. Be sure you have ***downloaded and saved the gauge data*** in TWO separate locations, and verified the gauge data is OK, BEFORE you DISCONNECT the Battery Fixture or install the RED KILL SWITCH! If you do, you will LOSE ALL YOUR DATA (Series 300 Gauge Only)!

2. ALWAYS remove the OLD/USED Battery Packs AFTER a JOB. Never store the gauge with old battery packs inside it because the batteries might leak and damage the gauge or battery fixture.



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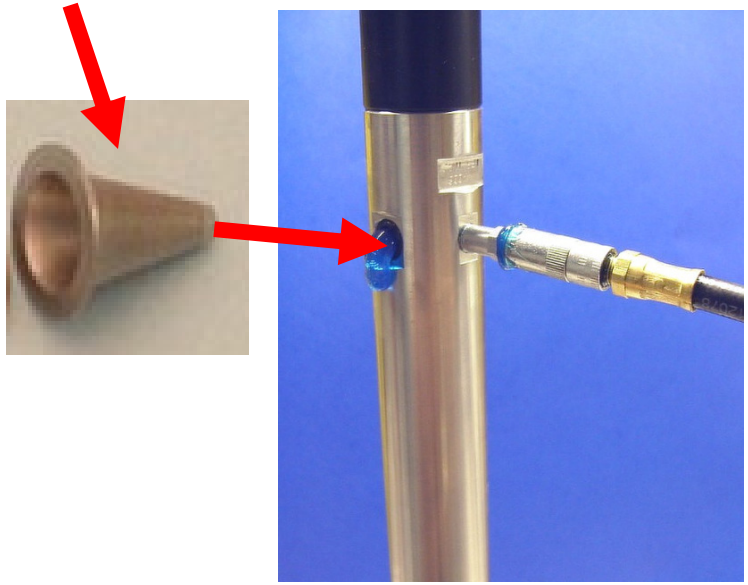
Gauge Maintenance Steps after EVERY Job!

After EVERY Job…

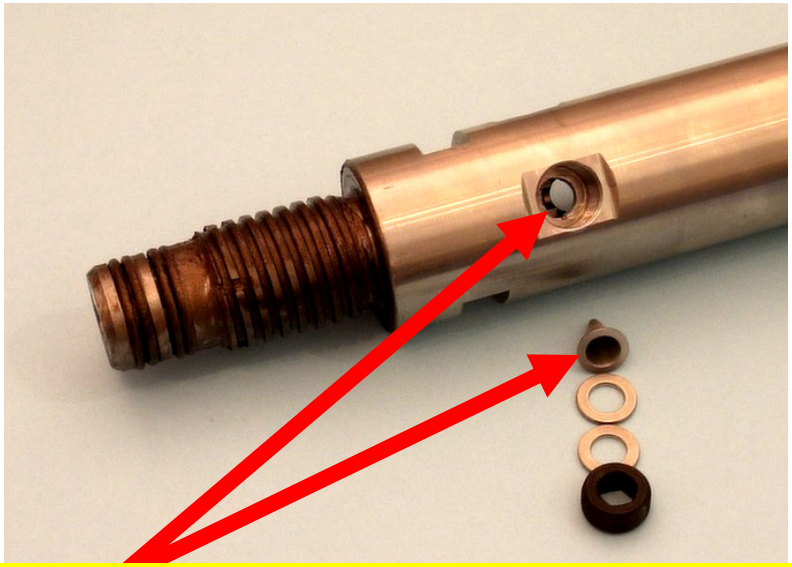
3. BEFORE you disassemble any part of the gauge, FIRST pump NEW grease (Blue FM Glacier grease) through the pressure ports with the grease gun connected to a 1/8” NPT grease nipple, until the grease comes out clear blue. *This will clean out the small micro screen holes.*



Gauge Maintenance Steps after EVERY Job!

After EVERY Job…

4. NEXT, inspect the micro screens for any damage. FIRST, unscrew the hollow lock nuts, and THEN pump the micro screens out by using the grease gun connected to the 1/8” Grease nipple.



DO NOT stick any objects into the Pressure Ports to remove the Micro Screens!!

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Gauge Maintenance Steps after EVERY Job!

After EVERY Job…

5. Remove and replace **ALL** the **#2-125** and **#2-018** O-Rings (Viton or Aflas) in the OWR Section and Battery Sections of the Gauge. Inspect the PEEK backup rings and replace, *as needed*. *Only replace the #5-964 O-rings, if they are damaged.*

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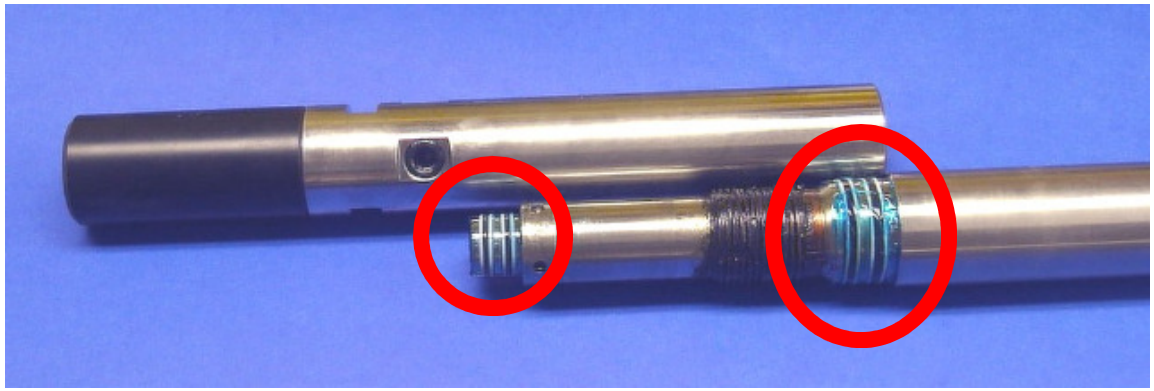
Gauge Maintenance Steps after EVERY Job!

After EVERY Job…

6. Remove and Replace the Large (#2-125) and Small (#2-018) INTERNAL O-Rings located inside the OWR Section (between the OWR Section and SENSOR Section). Inspect PEEK backup rings and replace, *as needed.*



Gauge Maintenance Steps after EVERY Job!

After EVERY Job…

7. *IMMEDIATELY* after the job, Disassemble, inspect, and **Re-Grease** the Shock Mitigater. Replace the shoulder bolts, Viton tubing, and any #5-964 O-rings, if damaged.

Note: Rebuild the Shock Mitigater immediately after your JOB to prevent the shoulder bolts or Shock Mitigater from rusting or seizing.

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Breaking the Gauge Sections Apart AFTER a Job

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Breaking the Gauge Sections Apart AFTER a Job

ONLY use the supplied ½" HEX Wrenches to break the gauge sections. DO NOT use a PIPE WRENCH!

Scarring the surface could damage the High Pressure Rating of the gauge.

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Remove the USED/OLD Battery Pack after EVERY Job

Before Removing the OLD/USED Battery Pack after a JOB…

1. Be sure the Gauge data is saved in TWO separate locations.
2. Have someone verify the data is OK.
3. THEN, you can disconnect the Battery Pack and properly discard the battery, to prevent leakage from damaging the Gauge.

NOTE: NEVER store a Gauge in Storage with a Battery Pack still installed inside it! It could leak and damage the gauge or battery fixture.

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Series 300 Battery Warnings!

The Series 300 Gauge uses Volatile Data Memory, so if you **remove** the battery power from the Gauge…

- the Gauge Data will be ERASED and permanently LOST!

If you **remove or discount** the Battery Fixture from the Gauge (OWR Section)…

- the Gauge Data will be ERASED and permanently LOST!

If you **loosen** the Battery Section of the Gauge…

- the Gauge Data will be ERASED and permanently LOST!

If you **install** the "RED KILL SWITCH" in the Battery Fixture…

- the Gauge Data will be ERASED and permanently LOST!

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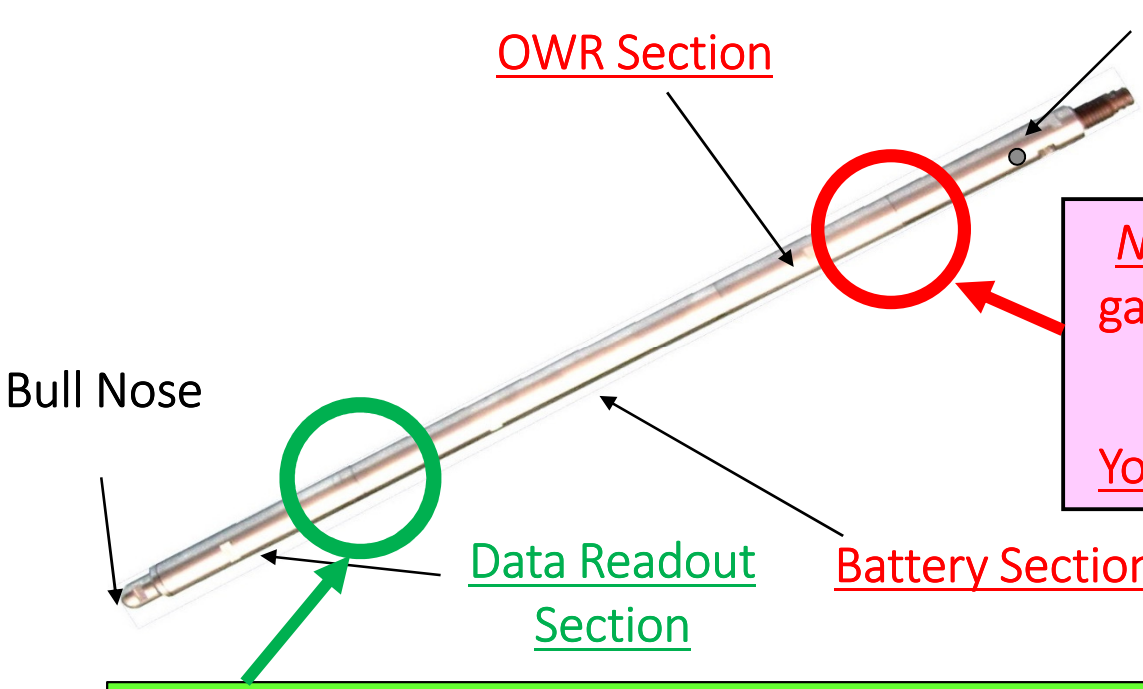
Series 400

The Series 400 Gauge uses NON-Volatile Data Memory, so if you **remove** the battery power from the Gauge, the data will remain in memory.

The gauge data is only *erased* if the gauge is “STARTED” again.

Series 300 Battery Warning!



NEVER break the Series 300 gauge between the OWR and BATTERY Sections.

You will lose ALL your data !!!

ALWAYS break the Gauge at the Data Readout Section, to download the data!

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Pressure Port Maintenance after EVERY Job

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Clean the Pressure Ports and Micro Screens after EVERY Job

FIRST, always Pump *NEW* Blue Glacier FM Grease through the Pressure Ports after *EVERY* Job ***BEFORE*** *you unscrew the Sensor Section and OWR Section.*

a. Leave the Micro Screens installed.

b. Using a Grease Gun connected to the 1/8” NPT port with a grease nipple, pump Blue Glacier FM grease into the Sensor Section until clear blue grease comes out of both pressure ports.

c. This cleans out the 4000 holes in the Micro Screens.

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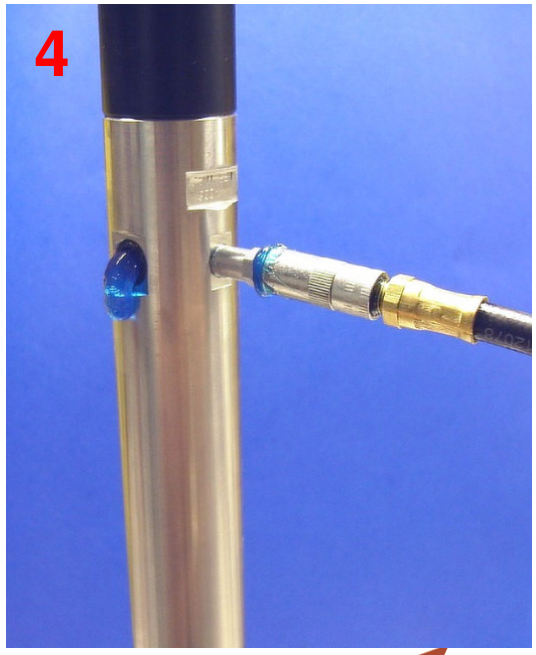
Clean the Pressure Ports FIRST



Using the Grease Gun, pump Blue Glacier FM grease into the Gauge Sensor Section until clear blue grease comes out of both pressure ports.

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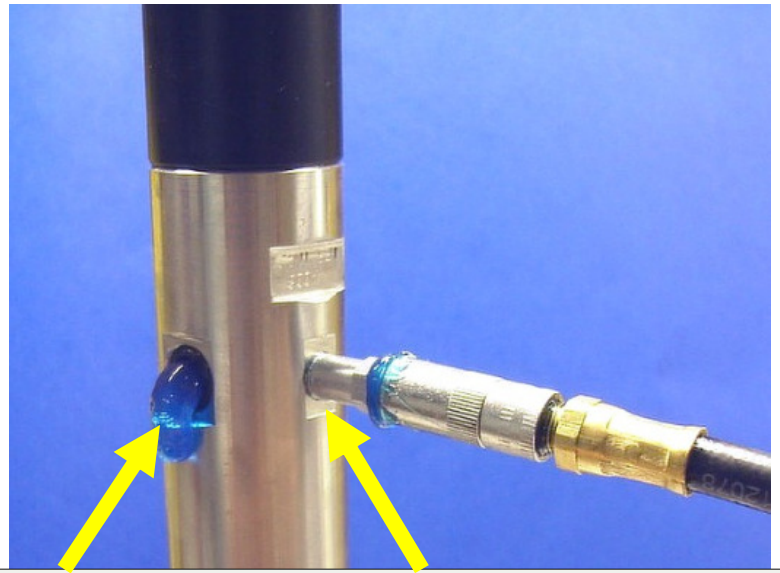
Removing both Pressure Port Micro Screens

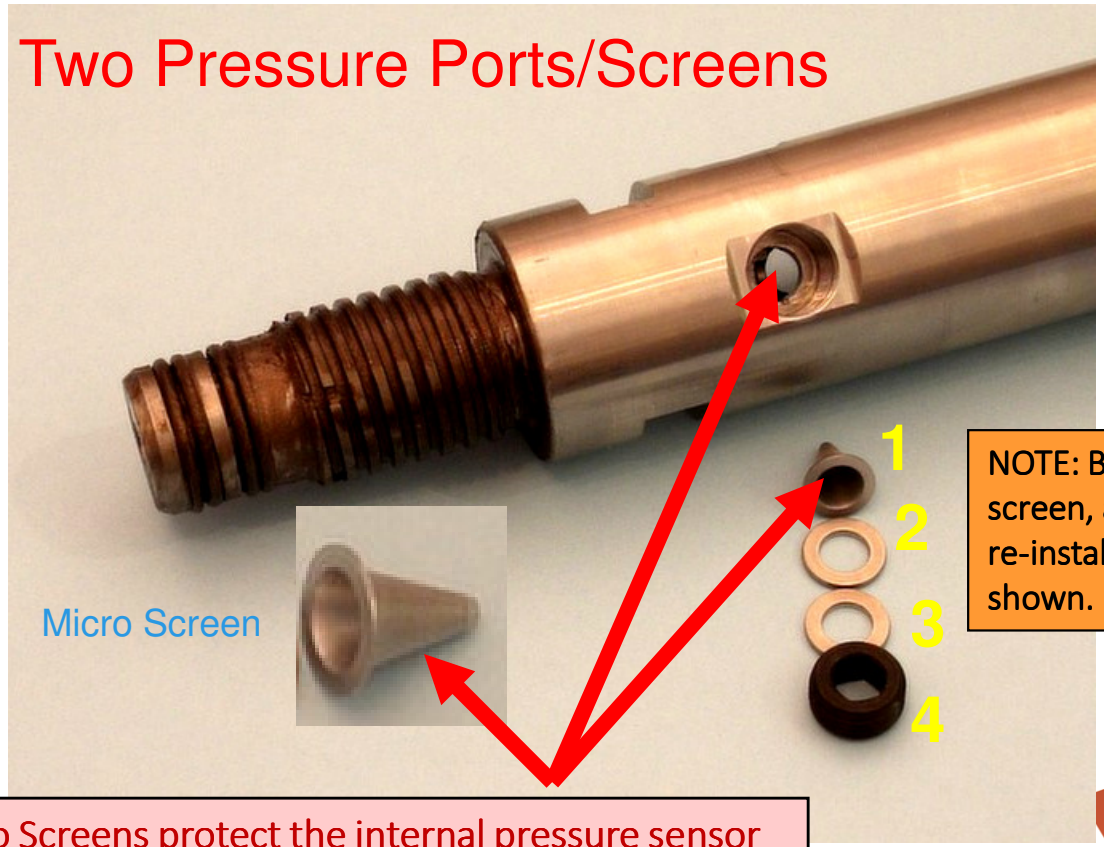


1. After cleaning the screens, unscrew the TWO hollow lock nuts holding the screens in place.

2. Install the 1/8” Grease Nipple and use the grease gun to “pump out” the screens for inspection.

DO NOT insert any object inside the pressure ports to try to pry the screens out!! They will be damaged!!

Inspect the Pressure Port Micro Screens for Damage



NOTE: Be sure the micro screen, and 2 washers are re-installed in the order, shown.

Micro Screens protect the internal pressure sensor from well debris, and must ALWAYS be used. Inspect and clean them after EVERY job.

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Replace ALL the Gauge O-Rings after EVERY Job

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Replace ALL the Gauge O-Rings after EVERY Job

Replace ALL the Internal and External Gauge O-Rings after EVERY job

- External O-Rings (#2-125, 75A or 90A): in the Battery Section and OWR Section
- Internal O-Rings (#2-125 and #2-018, 75A or 90A): Between the Sensor Section and OWR Section

- Large Stub Acme Thread O-Rings (#5-964, 90A) do not have to be replaced unless they are physically damaged. They are located in the Bull Nose, Sensor Section, and Shock Mitigater

*Inspect the PEEK Backup Rings and replace as needed

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Replacing the O-Rings on the Large Stub Acme Threads

Large Stub Acme Thread O-Rings

Replace the Large Stub Acme Thread O-Rings (#5-964, 90A) in the Bull Nose, Sensor Section, and Shock Mitigater if they become nicked or torn, *AS NEEDED*. Use four O-rings, two per groove.

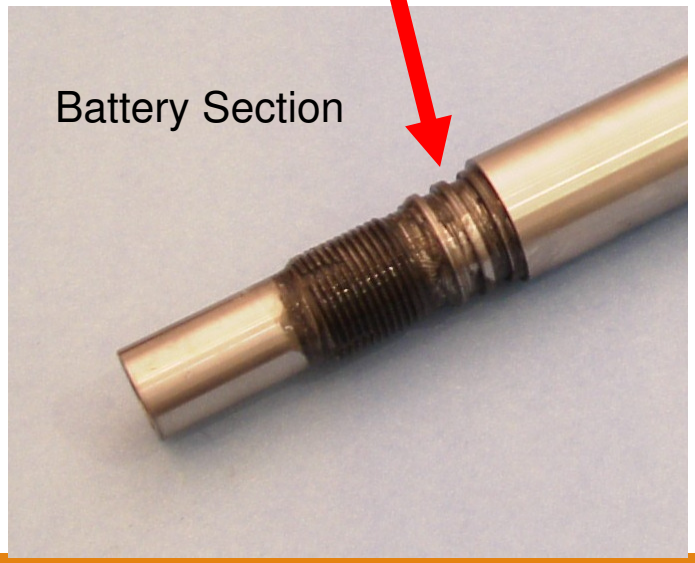
Replacing the External O-Rings after EVERY Job

(Battery Section and OWR Section)

External O-Rings

OWR Section
(Connector Side)

Replace the Large O-Rings (#2-125. 75A or 90A) on the Battery Section and the OWR Section, after EVERY Job.



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Procedure for Replacing the Internal O-Rings after EVERY Job

(Between the OWR and SENSOR Sections)

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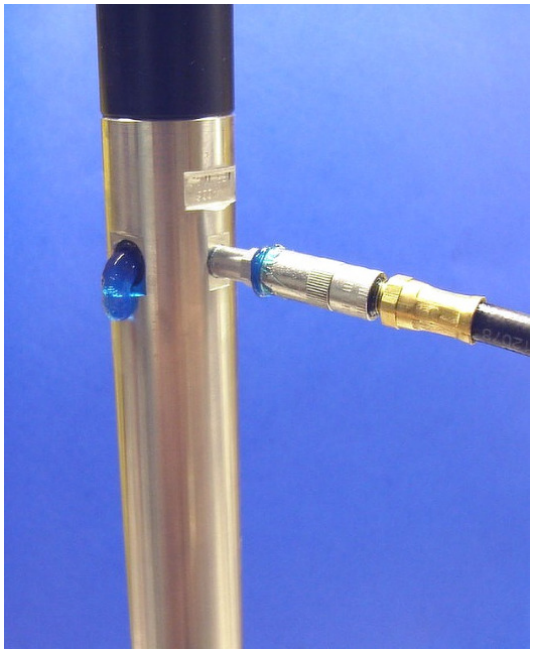
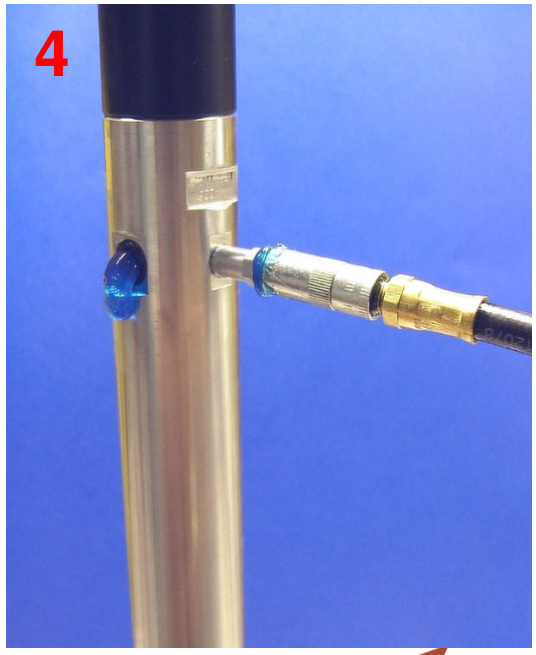
Clean the Pressure Ports FIRST!

1. FIRST, Be sure you have cleaned out the dirty grease inside the pressure sensor ports by connecting a grease gun/nipple to the 1/8” port , and pump new Blue FM Glacier Grease into the pressure port section of the gauge until clear blue grease comes out of both ports.



Clean the Pressure Ports and Micro Screens FIRST



FIRST, pump Blue Glacier FM grease into the Gauge Sensor Section until clear, blue grease comes out of both pressure ports.

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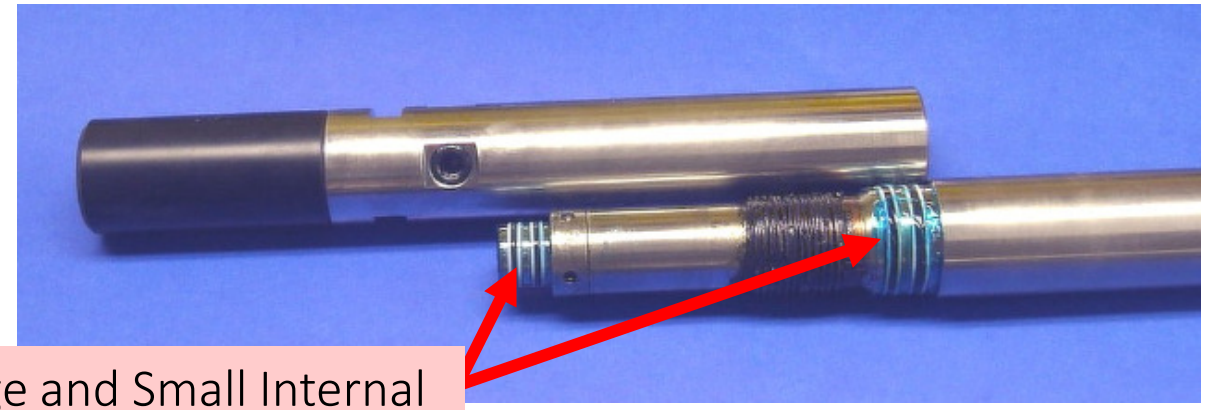
Replace the Internal (Large and Small) O-Rings

2. Next, Unscrew the Sensor Section and the OWR Section.

Replace ALL the Internal O-Rings

3. Remove and replace ALL the Large #2-125 and Small #2-018 internal O-Rings (Viton or Aflas), between the OWR Section and SENSOR Section.



Large and Small Internal O-Rings

NOTE: The O-Rings MUST be replaced after EVERY Job!

Inspect the internal PEEK backup rings and replaced as needed. Re-grease the O-Rings.

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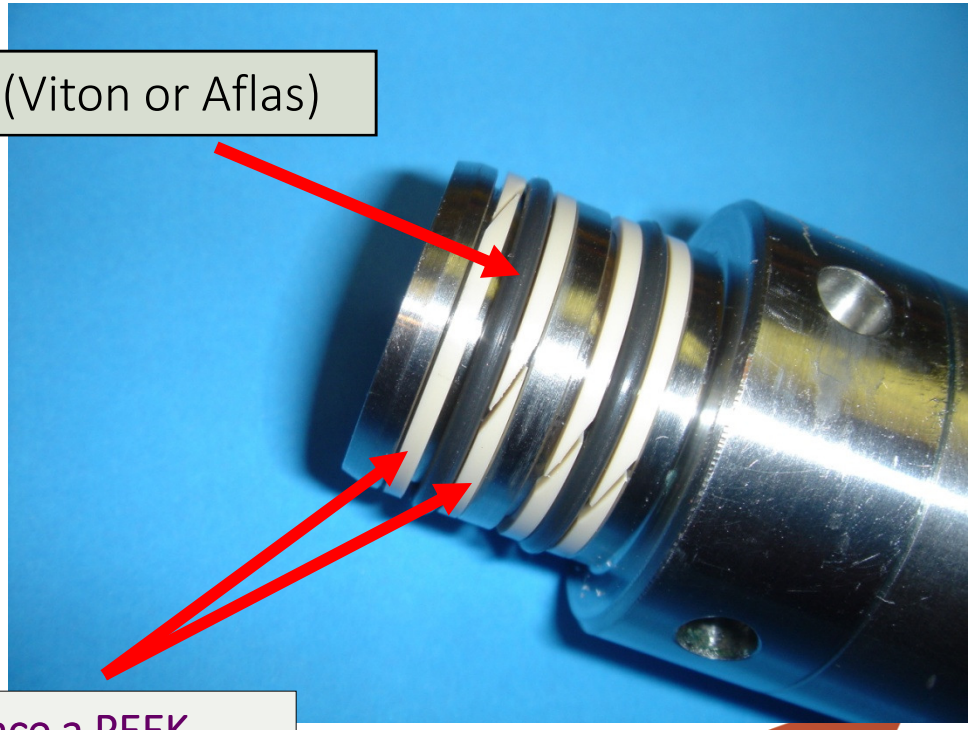
Install New “Small” Internal O-Rings

O-Ring #2-018, 75A or 90A (Viton or Aflas)



Install new O-Rings and place a PEEK backup ring on EACH side of the O-Ring

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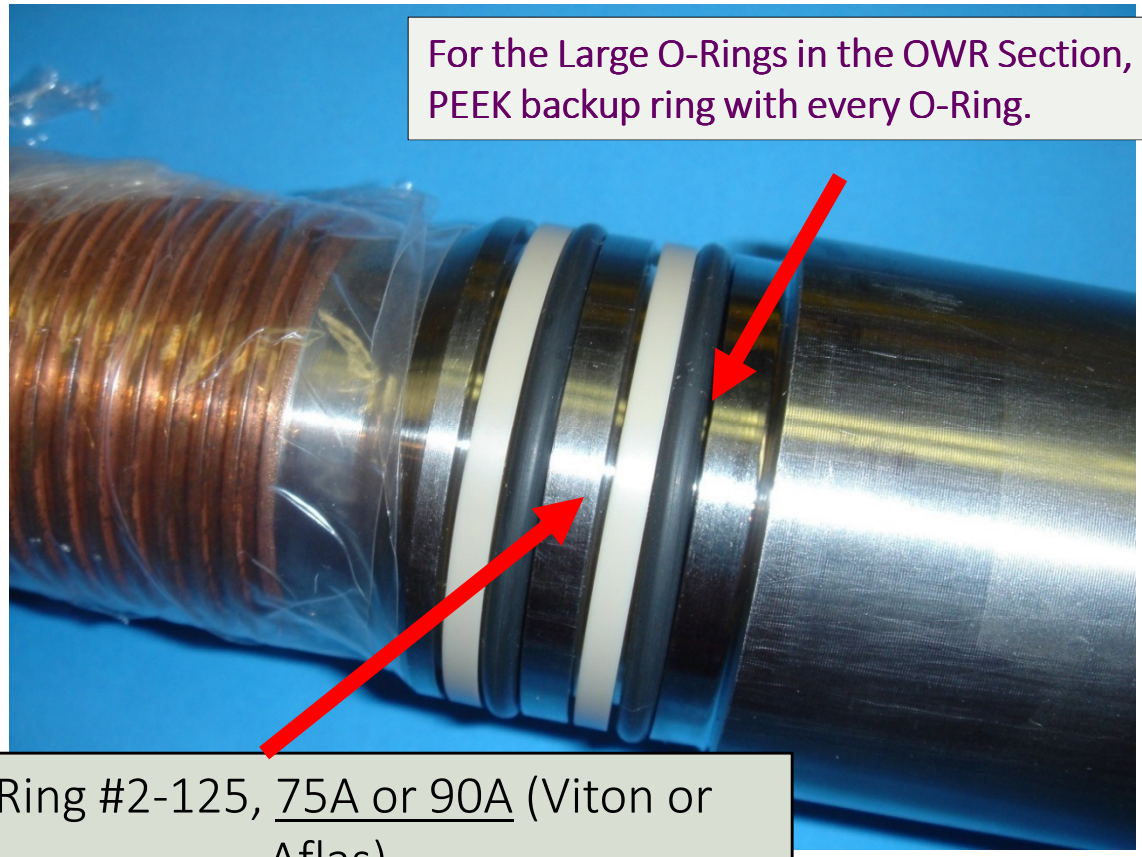
Check PEEK Backup Rings “Placement”

BE SURE the PEEK backup ring “groove” is in the correct position

Install New “Large” Internal O-Rings and Peek Backup Rings



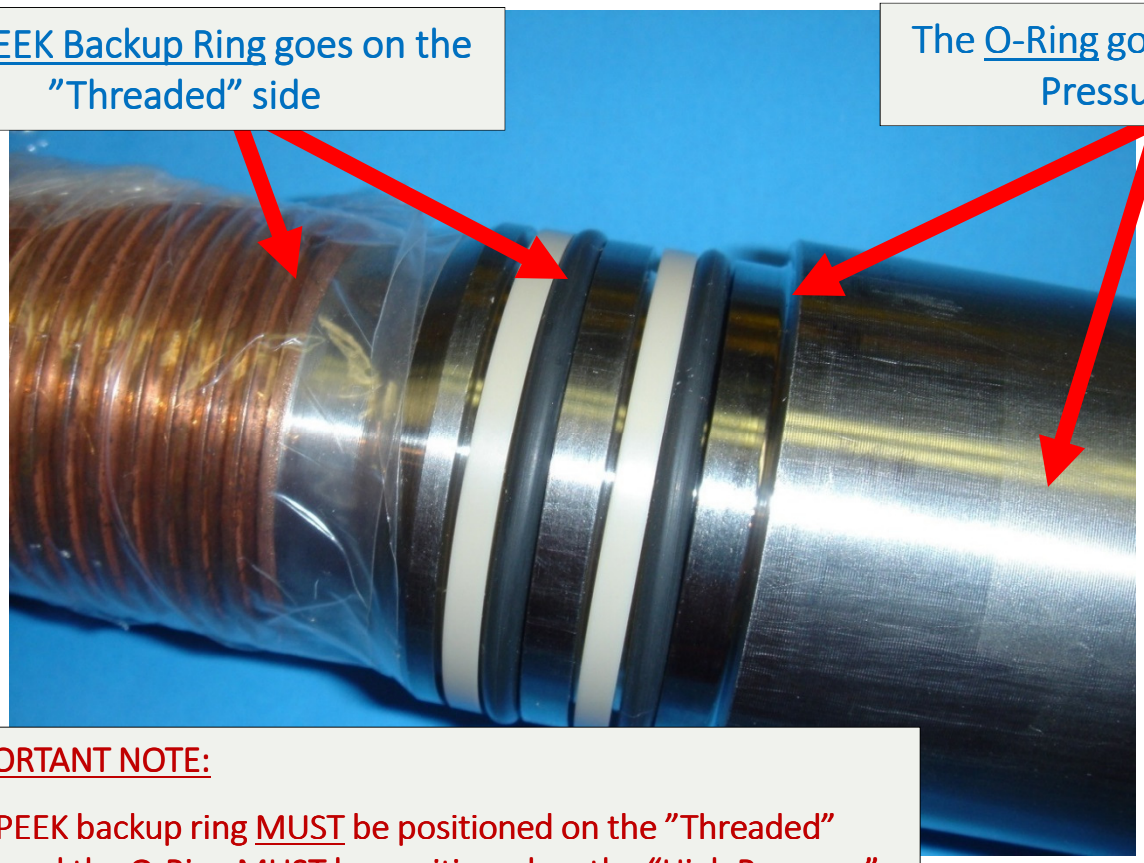
For the Large O-Rings in the OWR Section, use only ONE PEEK backup ring with every O-Ring.

O-Ring #2-125, 75A or 90A (Viton or Aflas)

Be sure the Peek Backup Ring is in the Right Position

The PEEK Backup Ring goes on the "Threaded" side

The O-Ring goes on the "High Pressure" side



IMPORTANT NOTE:

The PEEK backup ring MUST be positioned on the "Threaded" side, and the O-Ring MUST be positioned on the "High Pressure" side. One Backup per O-Ring.

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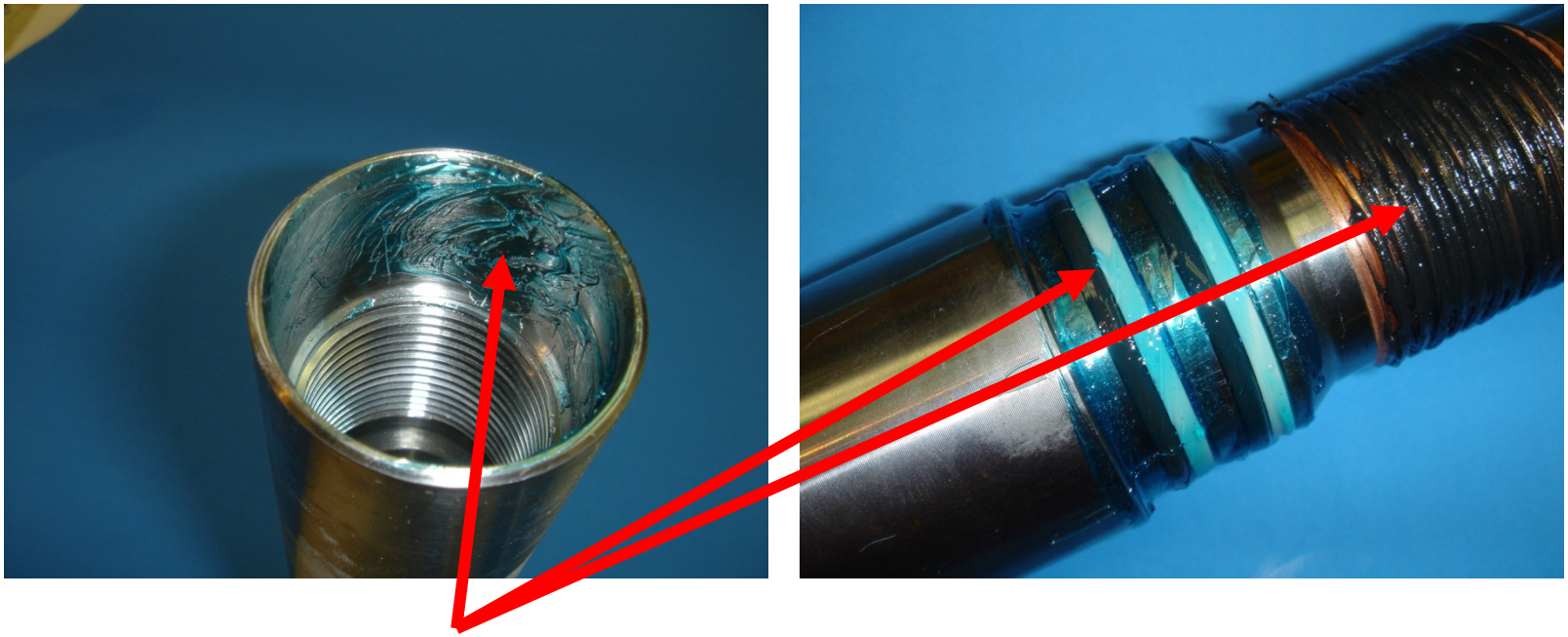
Grease the O-Rings



ALWAYS lightly grease the O-Rings with Blue FM Glacier grease, inside surface, and threads BEFORE assembling the gauge sections.

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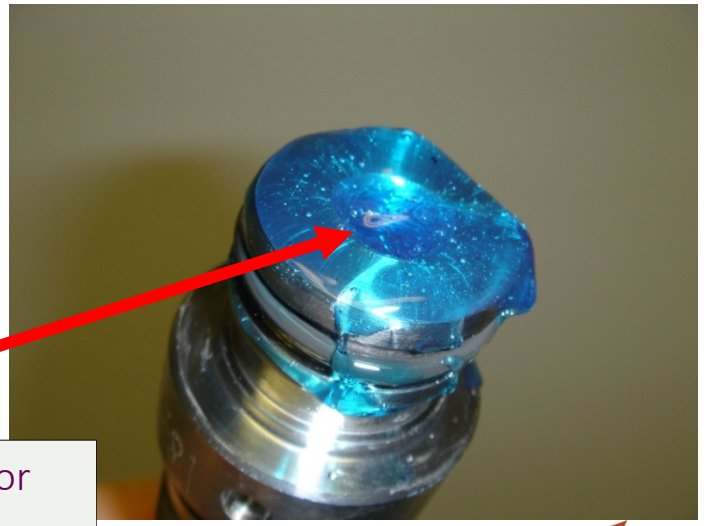
Put New Grease in Sensor Port

4. Clean out the internal pressure sensor cavity IF the grease is dirty. Use a Cotton Swab Tip. DO NOT insert anything sharp or hard into the pressure sensor cavity. Put new Blue FM Glacier Grease inside it, with your finger, filling it up to the top.



Clean out the old grease inside the pressure sensor port with a Cotton Tip Swab.

Put new grease inside the pressure sensor hole, and on the O-Rings

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Important!!

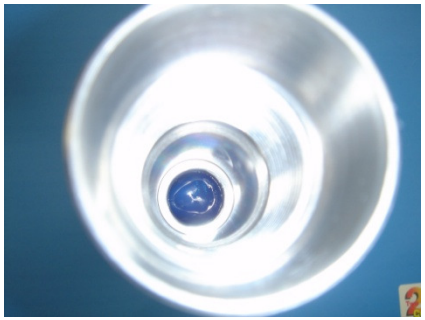
NOTE: DO NOT put any grease on the inside of the OWR Section, *between the small and large O-Rings.*

If you put too much grease inside the OWR SECTION, you will not be able to screw the Sensor Section and OWR Sections back completely together because it will form a “grease lock”. If this happens, you will need to remove the extra grease inside the cavity.

Fill the Sensor Cavity with Grease

5. (*First, be sure the micro screens, hollow lock nuts, and the 1/8" grease gun nipple fitting are installed.)*

Fill the **inner cavity** of the SENSOR SECTION with Blue FM Glacier Grease by pumping grease into it with the grease gun. Fill the ***FIRST SMALL CAVITY*** ONLY (see picture on next slide)!



**DO NOT put too much grease inside the SENSOR SECTION, OR you will not be able to screw the Sensor Section and OWR Sections back completely together, because it will cause a "grease lock". If this happens, you will need to remove the extra grease inside the cavity.

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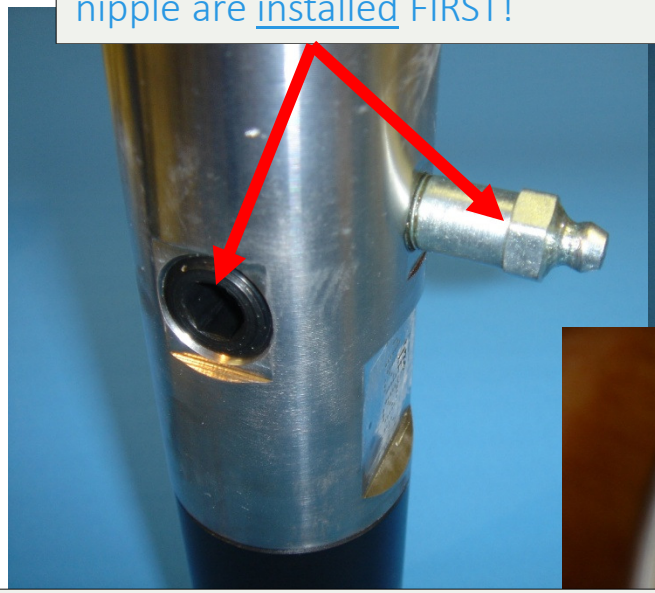
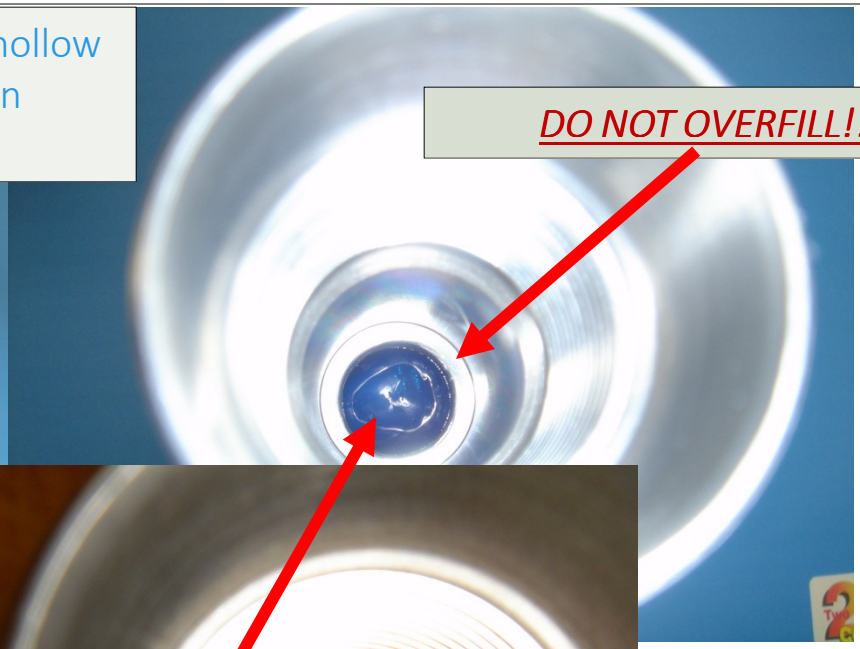
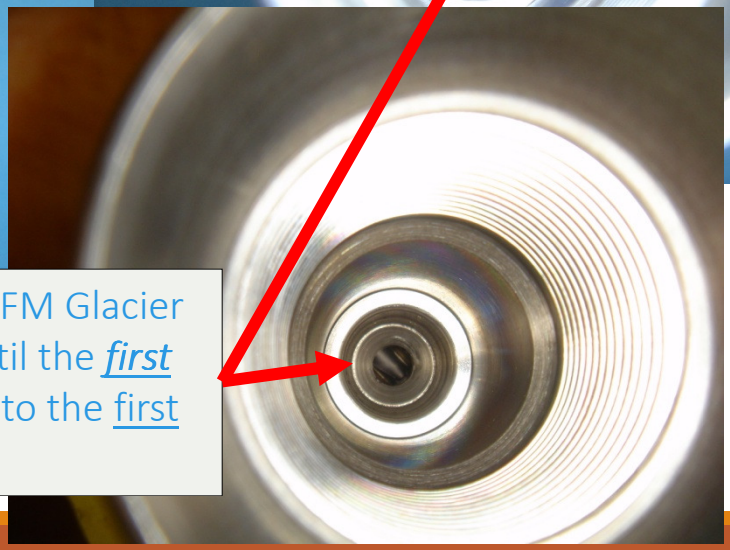
Fill the Sensor Cavity with Grease

First, be sure the micro screens, hollow lock nuts, and the 1/8" grease gun nipple are installed FIRST!



DO NOT OVERFILL!!





VERY IMPORTANT!! Pump BLUE FM Glacier grease into the grease fitting, until the *first* "deepest internal cavity" is filled to the first edge. *Use a flashlight to see.*

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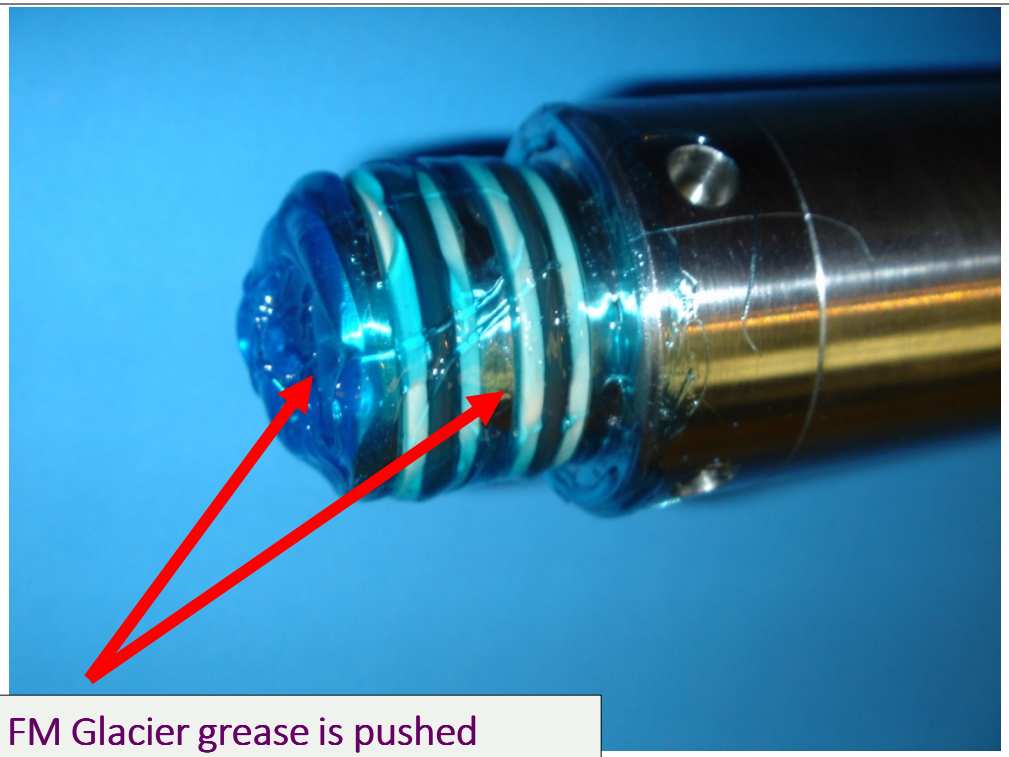
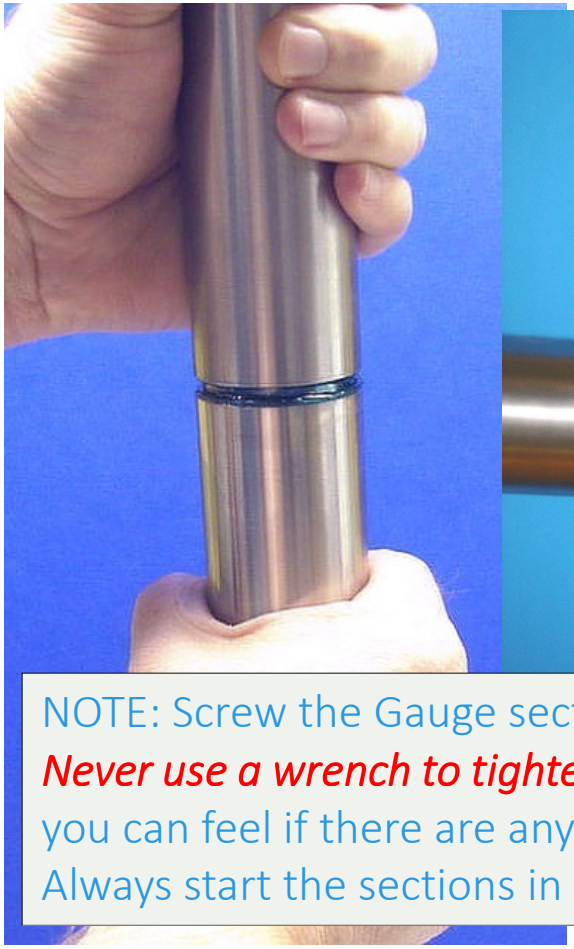
Grease the Sensor O-Rings



Be sure the Blue FM Glacier grease is pushed inside the pressure sensor hole, and covers the O-Rings. Remove any air bubbles in the grease.

Assemble the OWR and Sensor Sections Together



NOTE: Screw the Gauge sections together by hand ONLY. ***Never use a wrench to tighten the gauge sections!!*** That way you can feel if there are any problems with the threads. Always start the sections in the Vertical position.

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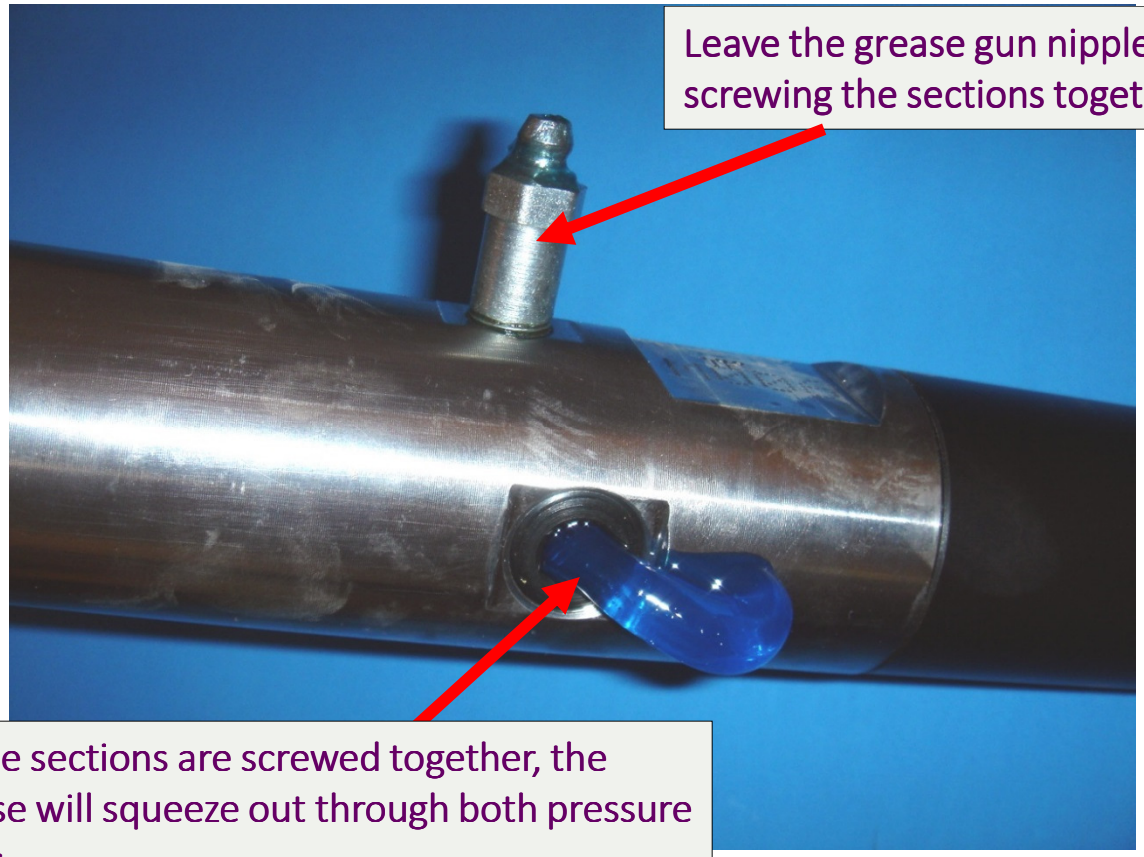
Assemble the OWR and Sensor Sections Together



Leave the grease gun nipple installed while screwing the sections together

As the sections are screwed together, the grease will squeeze out through both pressure ports

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Assemble the OWR and Sensor Sections Together

6. ***Screw the sections together BY HAND, ONLY!***

NOTE: NEVER USE A WRENCH TO TIGHTEN THESE GAUGE SECTIONS together!

The Sensor Section and OWR Section edges must meet together with ***NO GAP***.

NOTE: *If there is a GAP between the Sensor Section and OWR Section, then you will need to remove the excess grease inside the cavity, and STEP #5 will need to be repeated. Grease will come out the pressure ports as you screw the two sections together.*

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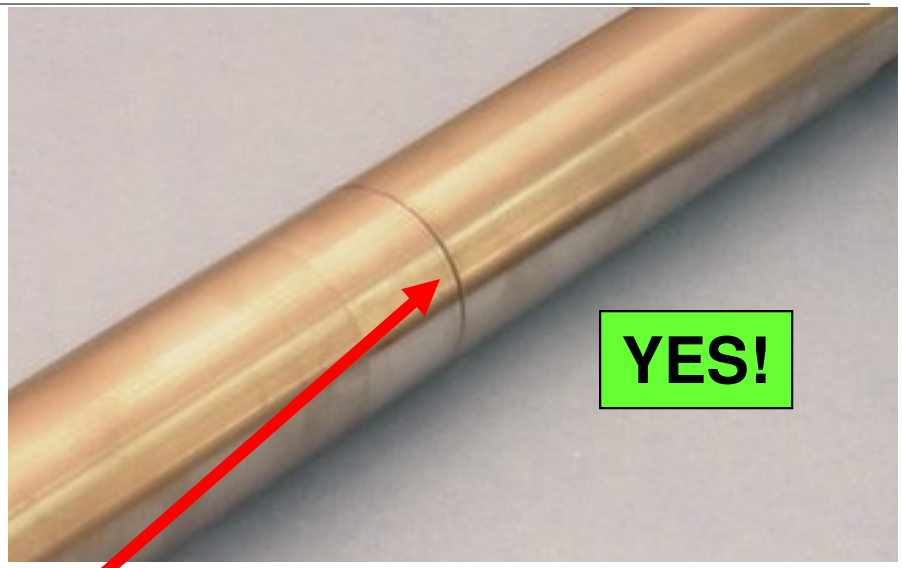
BE SURE Both Sections are Completely Assembled with NO GAP!



There should be NO GAP between the two Gauge Sections (Sensor Section and OWR Section) after they are screwed together!! If there is, you will need to unscrew the 2 sections and remove the excess grease inside.

Gauge Assembly and Maintenance
(Part 2 of 2)