Preparing the Gauge for a JOB
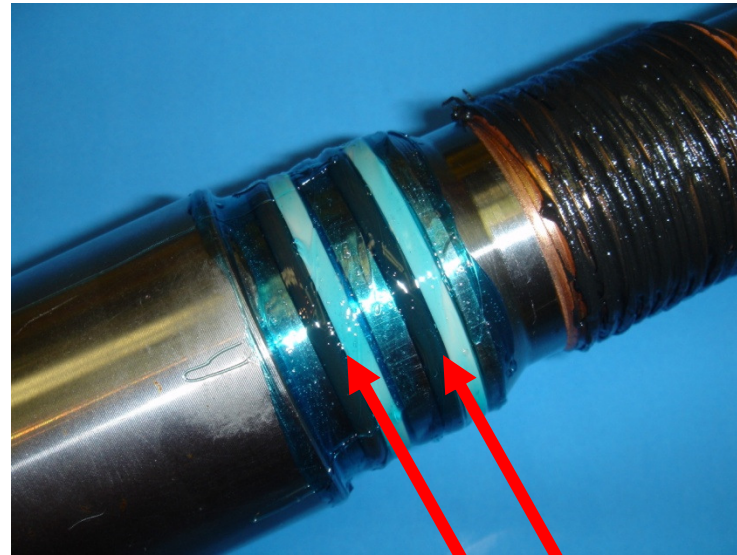
BY SCOTT A. AGER

SCOTT@IESGLOBALINC.COM

IES GLOBAL

WARNING!!!

WARNING !!!! ALWAYS install NEW O-RINGS on *every* Section of the Gauge housing, before EVERY JOB!

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Install and Test NEW <u>Battery Packs</u>
in the Battery Fixtures

◦ Install a <u>NEW</u> Battery Pack in the Battery Fixture(s).

◦ Test the Battery Fixtures by plugging them into the OWR section of the gauge. You can use the "extension cables" to plug the battery fixture into the OWR section.

◦ Write down the <u>S/N</u> of each Battery Pack used, for your records..

"Extension cable"

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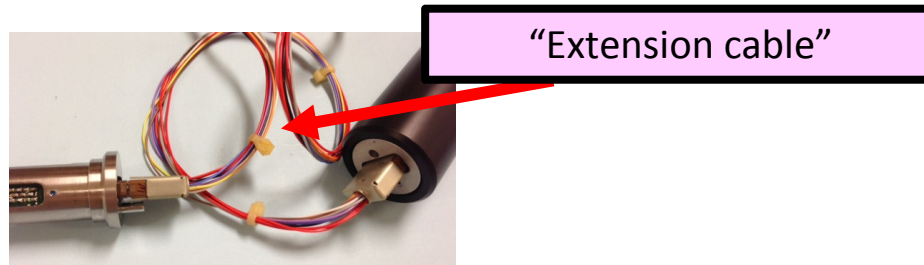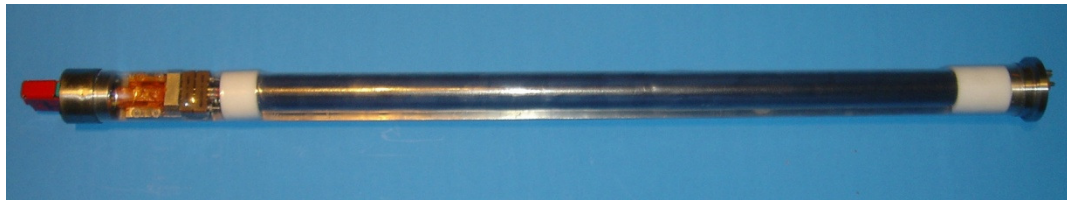
Identify if the Battery Fixture is a MASTER or SLAVE

Be sure you have identified which battery fixture is the MASTER and SLAVE if you are using **two** batteries for your JOB.
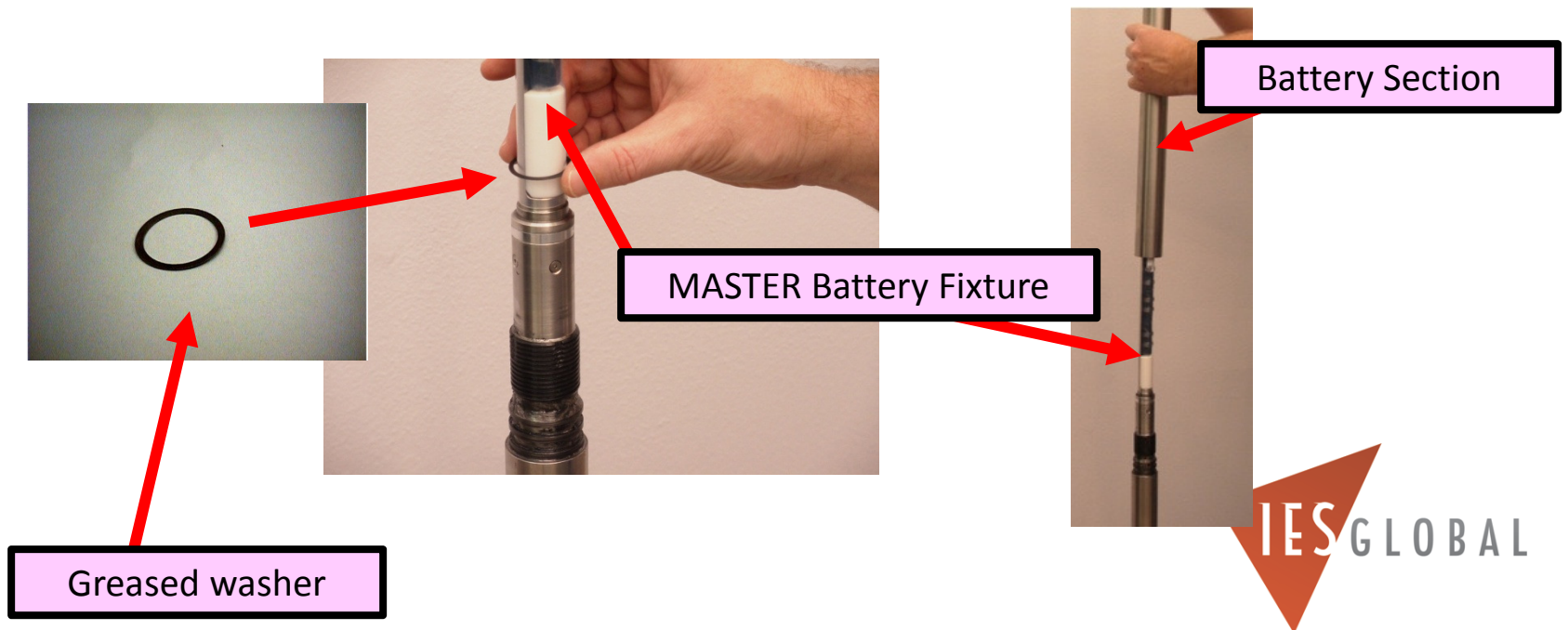
The SLAVE battery fixture plugs into the MASTER battery fixture if you are using two batteries for your JOB.

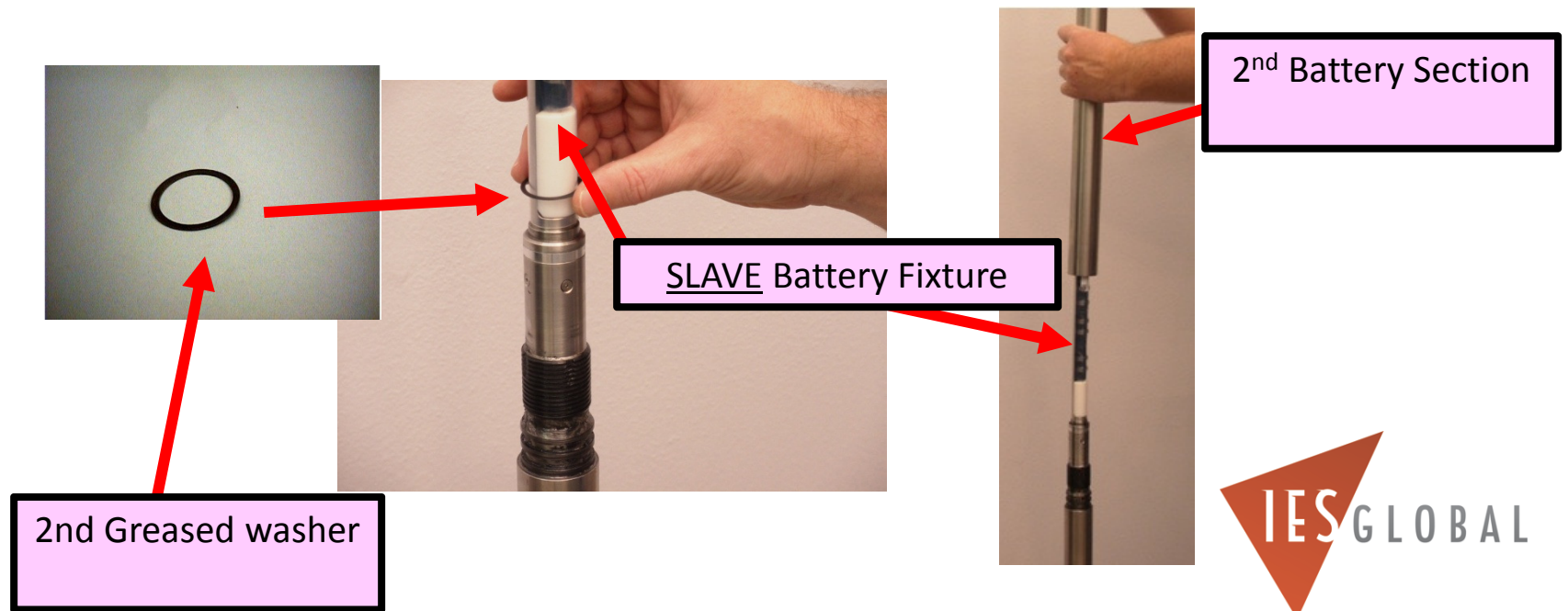**The MASTER battery fixture always plugs FIRST, into the OWR section of the gauge.**

MASTER Battery Fixture (no jumper)

SLAVE Battery Fixture (Jumper wire installed)

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Install the MASTER Battery Fixture in the Gauge

◦ Plug the **MASTER** Battery Fixture into the OWR section of the gauge, FIRST.

◦ Be sure the greased washer is installed on the battery fixture.

◦ Then, install the external Battery Section over the MASTER Battery Fixture.

Battery Section

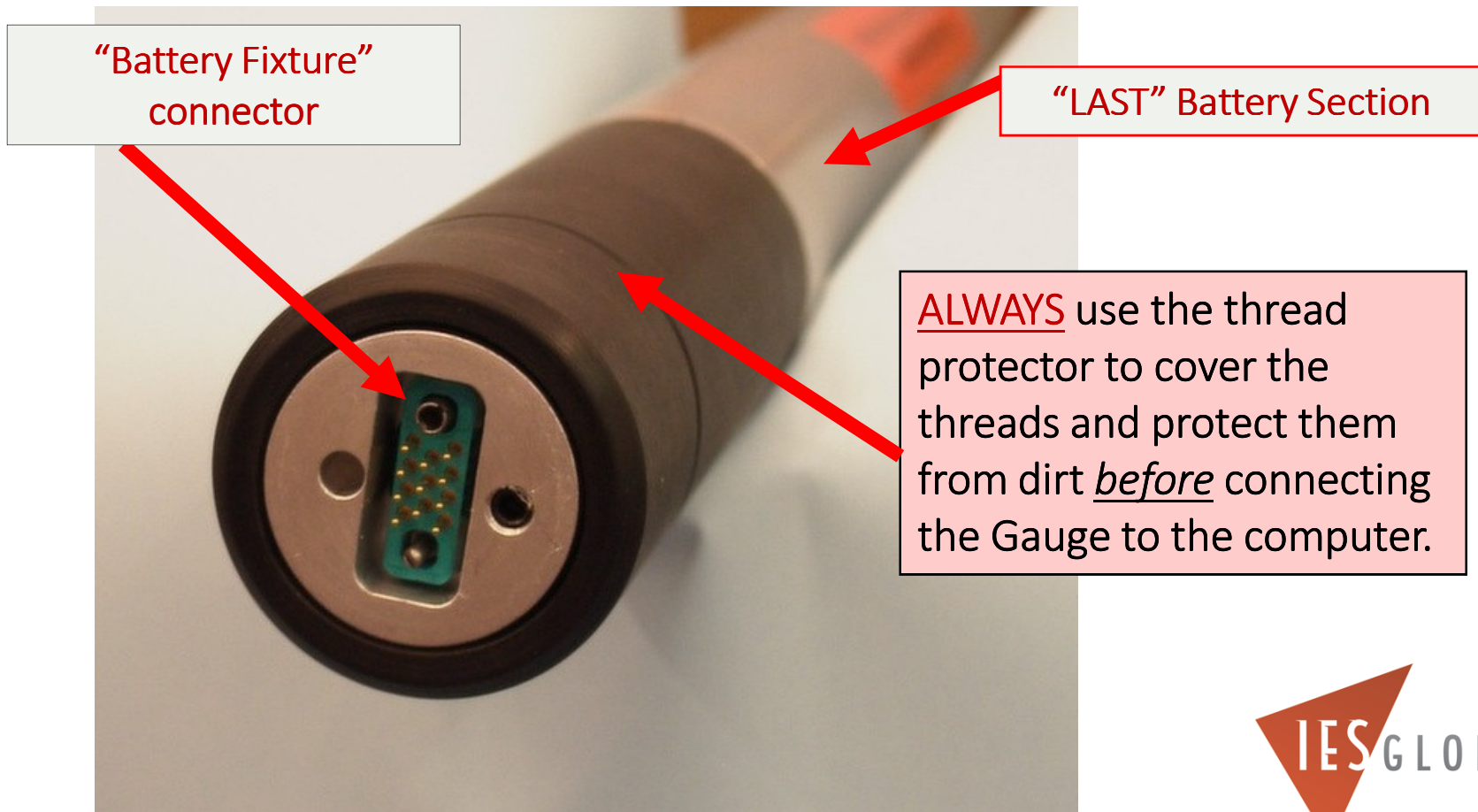MASTER Battery Fixture

Greased washer

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Install the <u>SLAVE</u> Battery Fixture in the Gauge <u>IF</u> you are using TWO Battery Packs

- ◦ If you are running **TWO batteries** on your JOB, then plug the **SLAVE** Battery Fixture into the MASTER Battery Fixture/battery section.

- ◦ Be sure the <u>second greased washer</u> is installed on the battery fixture

- ◦ Then install the 2nd <u>external Battery Section</u> over the SLAVE battery pack.

2nd Battery Section

SLAVE Battery Fixture

2nd Greased washer

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Install the Thread Protector Cover over the "LAST" Battery Section

"Battery Fixture" connector

"LAST" Battery Section

ALWAYS use the thread protector to cover the threads and protect them from dirt *before* connecting the Gauge to the computer.

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Connect Gauge to the Computer

◦ Start the OWR Gauge Software
◦ Plug the External 9 or 15 VDC Adapter to the Interface Box
◦ Connect the Interface Box to the Computer
◦ Connect the gauge to Interface Box (All 3 Lights should be ON)
◦ Make **LINK** to the Gauge (might take up to 30 seconds)


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Making LINK to the Gauge

When you first connect the gauge to the computer, it will search for the gauge. This could take up to 30 seconds.
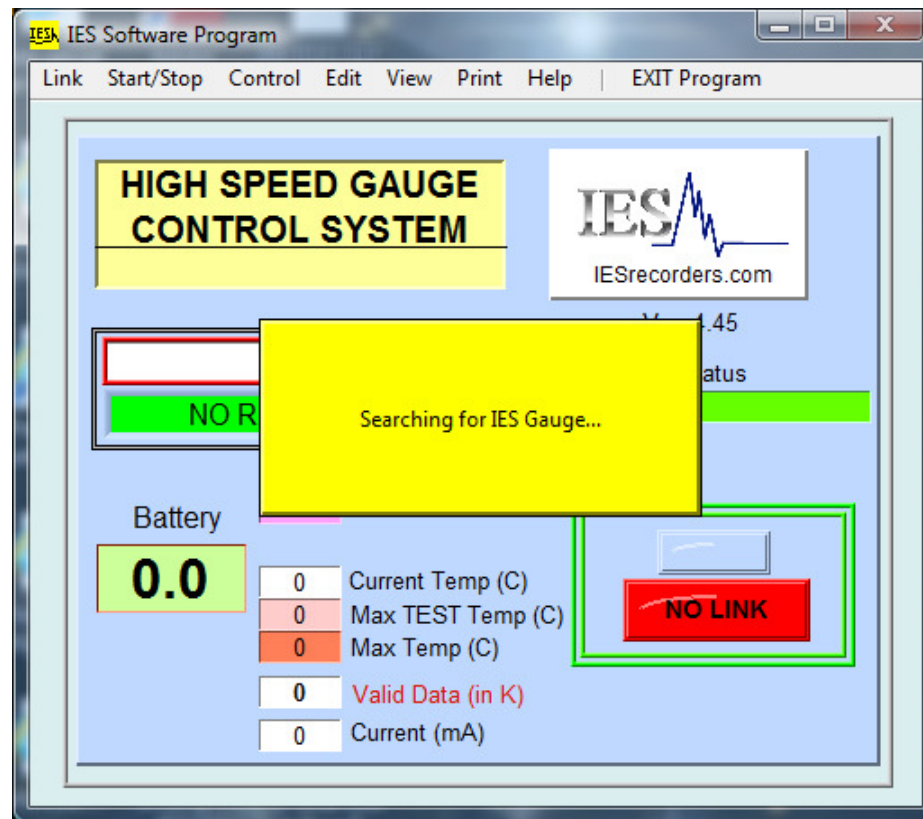
Making LINK to the Gauge

When you <u>FIRST</u> install new batteries into the gauge, and initially make link to the gauge, you will always get a "POWER INTERRUPTION" error. *This is NORMAL.*

Go to the CONTROL menu and select "Clear Error Flags" to clear the error.
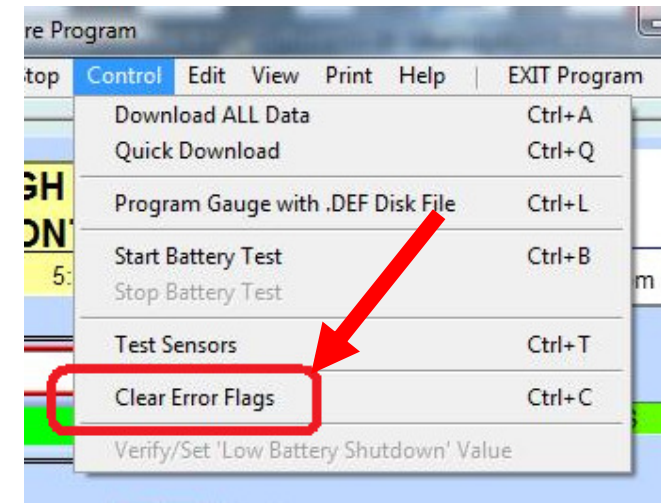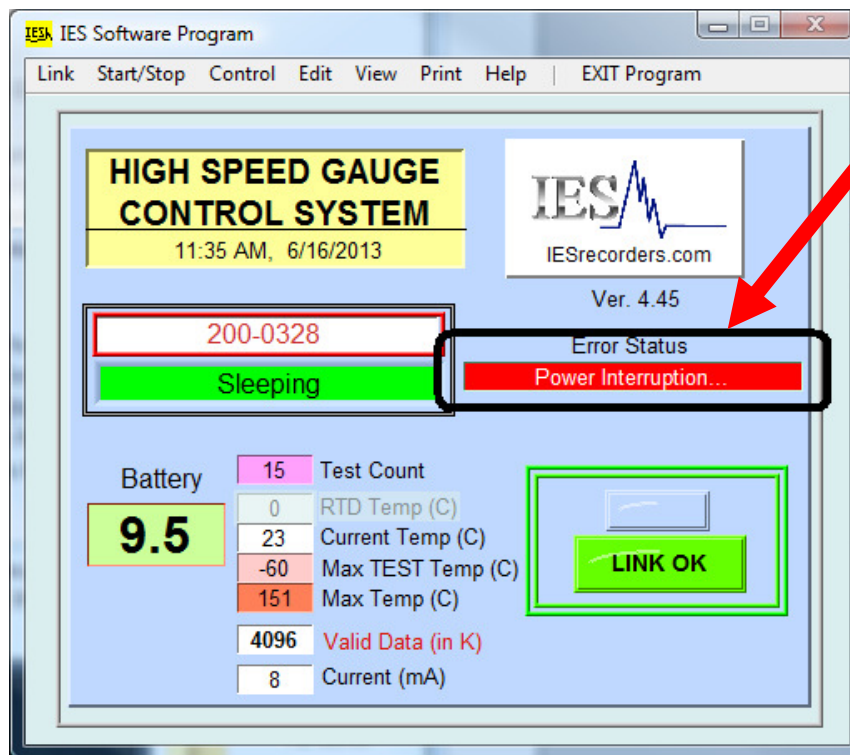
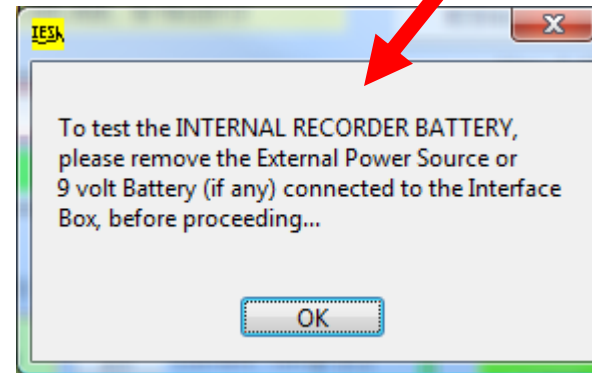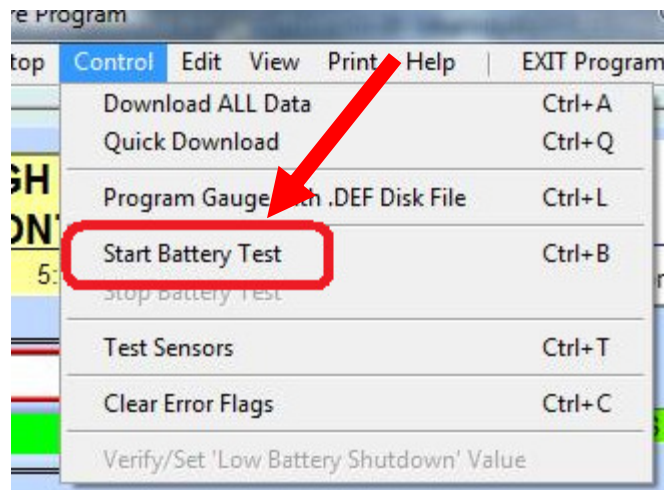# ALWAYS De-Passivate the Lithium Battery Pack before using it on a JOB

◦ If you are using Lithium battery packs for your JOB, you must FIRST *de-passivate* the Lithium battery packs.

◦ When Lithium batteries sit unused, they develop an internal "skin effect" which prevents them from working properly under load.

◦ By putting the Lithium batteries "UNDER LOAD" (in the STANDBY mode) for up to 10-15 minutes, it burns off this "skin effect". This allows the Lithium battery to output its full current capacity when the gauge is turned on.

NOTE: if you DO NOT de-passivate the Lithium battery packs before your JOB, the gauge could potentially shutdown prematurely while in the well, resulting in no collection of pressure data.

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To De-Passivate the Lithium Battery Pack...

◦ To de-passivate the Lithium battery packs installed in your gauge, you must put the gauge in the **STANDBY mode**.

◦ Go to the CONTROL menu and select "**START BATTERY TEST**"

◦ ***BE SURE*** *you* *disconnect* *the external 9 or 15 VDC power adapter from the Interface Box first.*
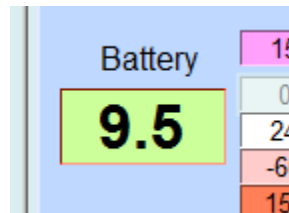
To De-Passivate the Lithium Battery Pack...

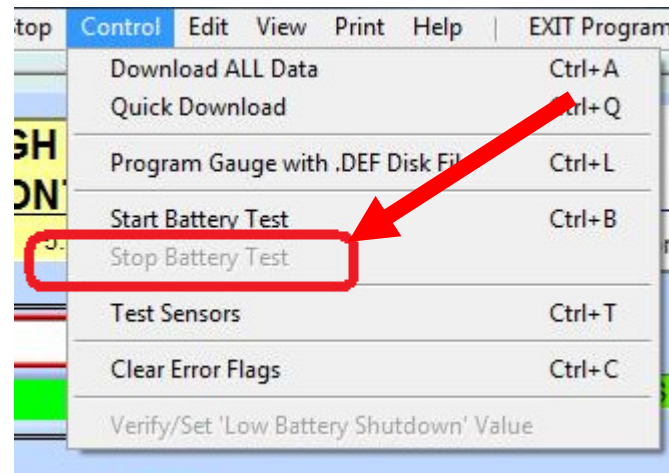◦ The gauge should be in the **STANDBY mode**.
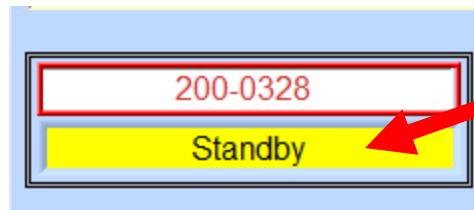
◦ *__**Be sure the external 9 or 15 VDC power adapter is <u>NOT</u> plugged into the interface box__*

◦ Leave the gauge in the **STANDBY mode** for a minimum of ***<u>10 - 15 minutes</u>***.

◦ After this time, the Lithium battery pack voltage should be **above ~9.0v** (3-Cell) **or 6.8v** (2-Cell). If not, the lithium battery pack could possibly be <u>BAD</u>.

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To <u>STOP</u> the De-Passivate Procedure for the Lithium Battery Pack…

◦ To <u>TURN OFF</u> the "the de-passivate" procedure for the Lithium Battery Pack, go to the CONTROL menu and select "**STOP BATTERY TEST**".

◦ The gauge should be in the **SLEEP mode** (low power mode).
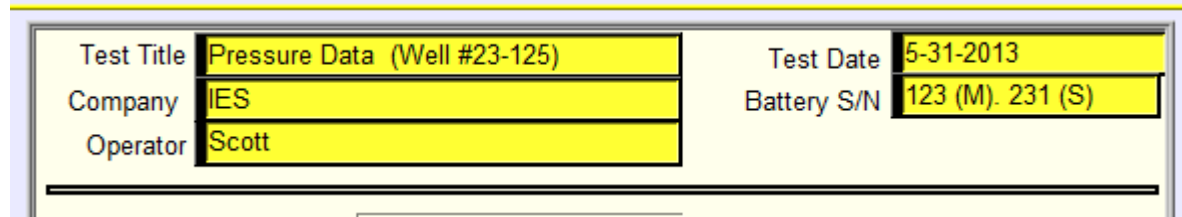
Programming the Gauge

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Programming the JOB Information into the "Recorder Channel Data" Menu

◦ Enter the **JOB Title, Date, Operator, and Battery Fixture S/N** information into the gauge for your JOB.

◦ This information is permanently saved into the gauge, and <u>attached</u> to your data file when you download the data after the JOB.

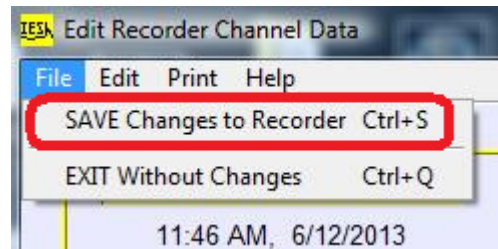◦ Go to the **EDIT** (Main) menu, and select "**RECORDER CHANNEL DATA**"

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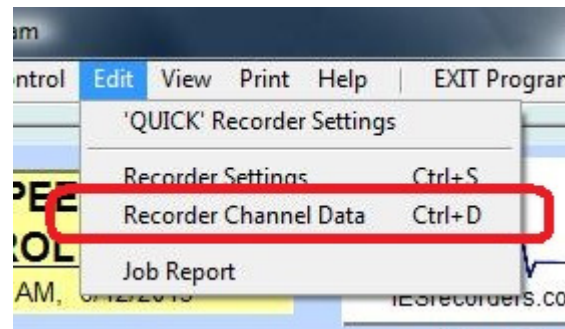
Programming the JOB Information into the "Recorder Channel Data" Menu

- ◦ You can change the information in the **YELLOW** boxes.

Test Title	Pressure Data (Well #23-125)	Test Date	5-31-2013
Company	IES	Battery S/N	123 (M). 231 (S)
Operator	Scott		

- ◦ Then select **FILE**, and "**SAVE Changes to Recorder**" to permanently save this information to the EEPROM in the gauge.

IES Edit Recorder Channel Data

File Edit Print Help

SAVE Changes to Recorder Ctrl+S

EXIT Without Changes Ctrl+Q

11:46 AM, 6/12/2013

- ◦ When you download data from the gauge, this information will always be attached to the data file.

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Programming Your JOB REPORT Information into the Gauge

◦ You can save more detailed information concerning your JOB into the gauge, by using the **JOB REPORT** feature. This allows you to add in more written information which is saved into the gauge's permanent EEPROM memory.

◦ This information is permanently saved in the gauge, and attached to your data file when you download the data after the JOB.

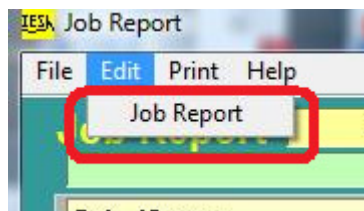◦ Go to the **EDIT** (Main) menu, and select "**JOB REPORT**".
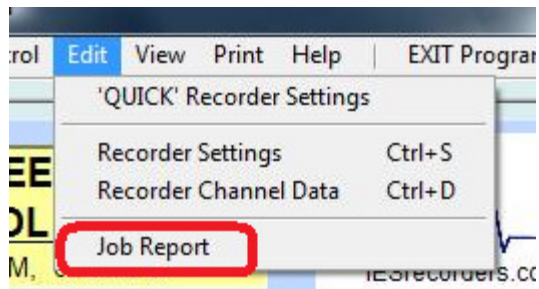
Programming Your JOB REPORT Information into the Gauge

◦ Enter more JOB details in **JOB REPORT** menu.
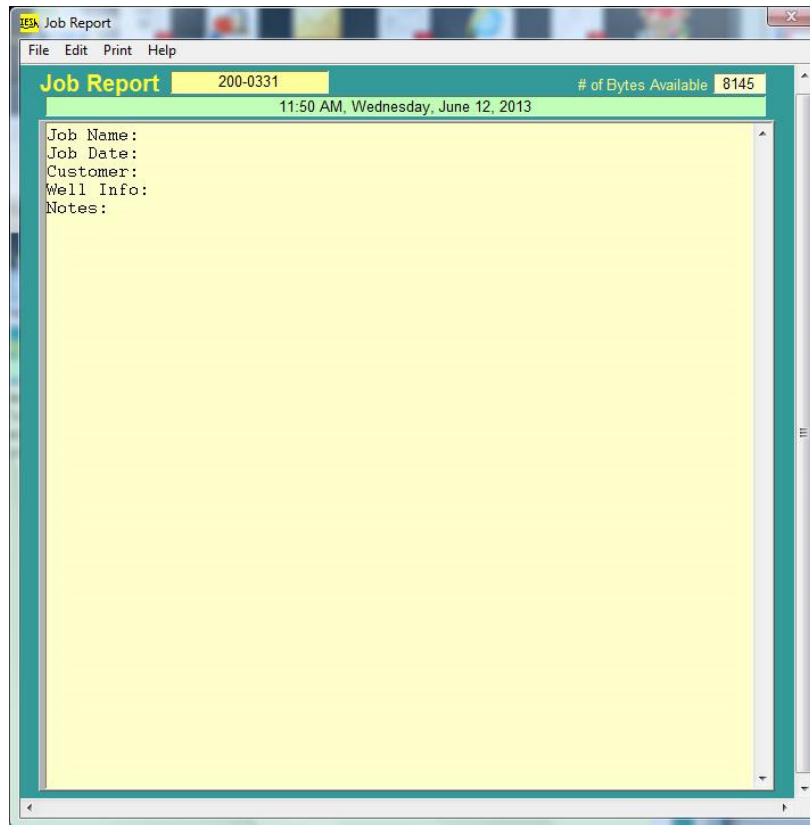
Programming Your JOB REPORT Information into the Gauge

◦ To edit the JOB REPORT and add your own information for your JOB, select **EDIT: JOB REPORT**.

Enter the password "IES" to edit

◦ You can type information directly in the editor, or go to the FILE menu and load a text template (.txt) file that you have previously written.

◦ To permanently **SAVE** this information to the gauge, go to the FILE menu, and select "**Save Job Report to Recorder**".


IES GLOBAL
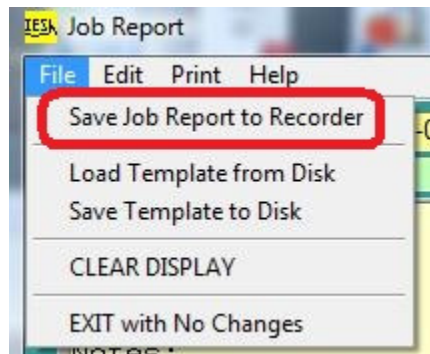
Programming the Gauge for your JOB

The gauge "settings" must be programmed into the gauge <u>BEFORE</u> your JOB.

There are <u>TWO</u> ways to program your gauge for your JOB.

- The easy way is, to use an <u>existing</u> **DEFAULT Settings File** (.def) which is used to directly program your gauge settings.

- If you send me (Scott Ager) a GAUGE WORKSHEET that you filled out for your JOB, I can use that to make a **DEFAULT Settings File (.def)** that I can email you, and you can use it to program your gauge <u>directly</u>.

- First, save the .def file I emailed you into your **C:/OWR 4-46** directory.

- Next, go to the **CONTRO**L menu and select "**Program Gauge with .DEF Disk File**". Enter the.def file name. The screen should say that your gauge was successfully programmed.
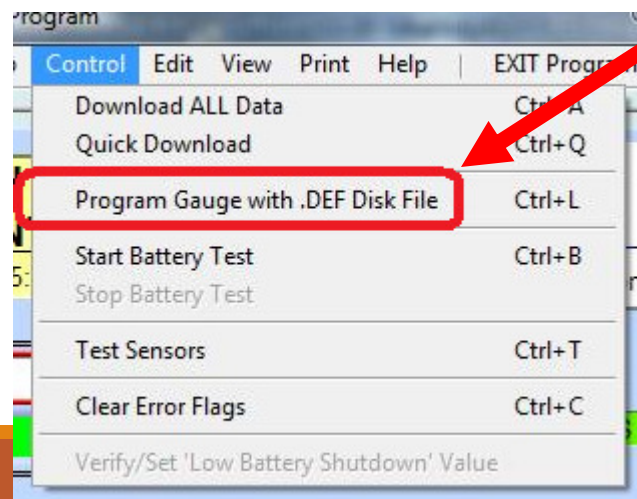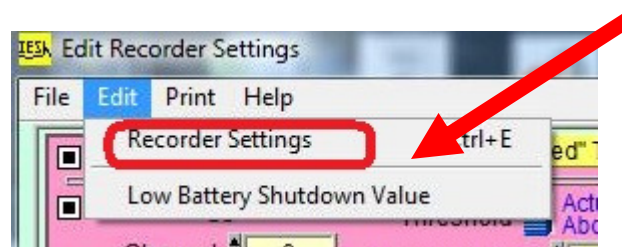
Programming the Gauge for your JOB

The **2nd way** to program your gauge settings for your JOB, is to go to the Gauge Settings Menu.

- Go to the <u>MAIN</u> **EDIT** menu, and select **RECORDER SETTINGS**.
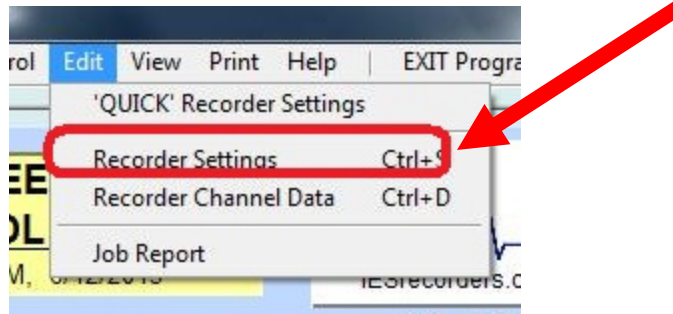
- ◦ Then, BEFORE you can edit any gauge settings, you must go to the "Edit Recorder Settings" **EDIT** menu, and select **RECORDER SETTINGS**.
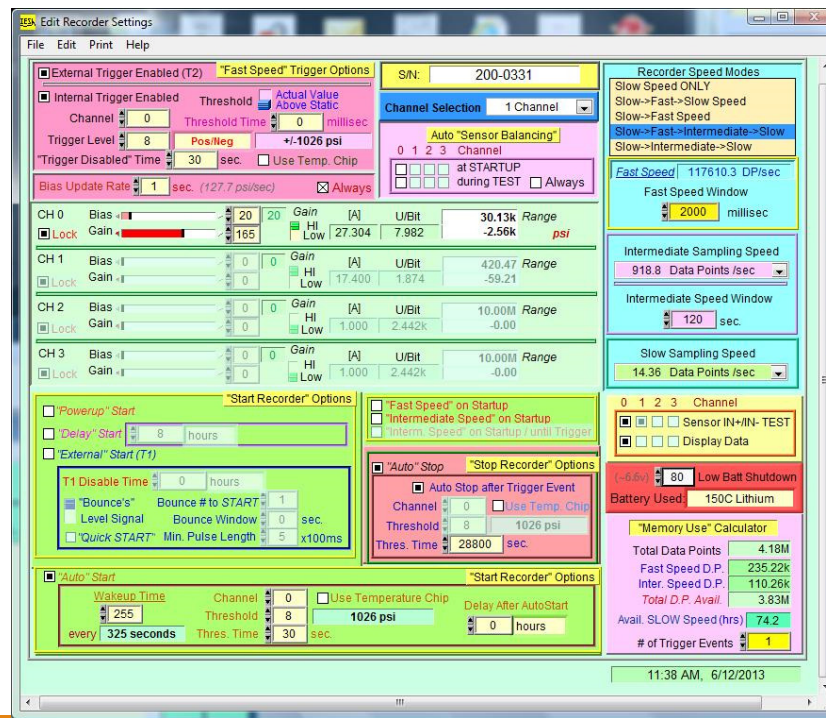

- ◦ *Enter the PASSWORD "IES"*

Programming the Gauge for your JOB

- You can now **_MANUALLY_** make changes to your gauge settings for your JOB.

- **PLEASE NOTE**: be careful of what changes you make, is they could prevent the gauge from collecting pressure data.

- **_ALWAYS_** send me a picture of the Gauge Settings screen so I can review your gauge settings.

Programming the Gauge for your JOB

- If you have <u>made any changes</u> to the gauge settings that you want to keep, <u>ALWAYS</u> SAVE the settings back to the gauge!

- To **SAVE** any gauge settings back the gauge, go to the FILE menu, and select
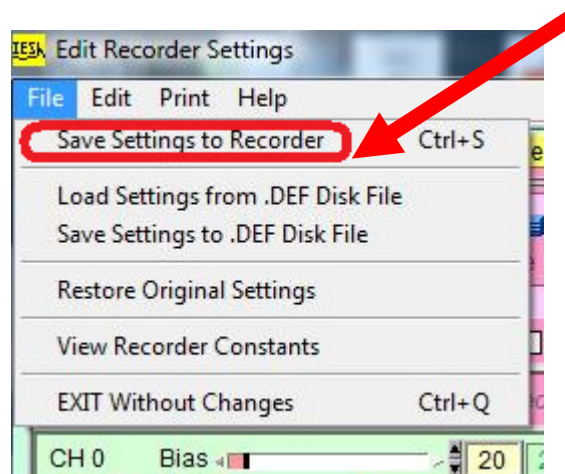
- **WARNING!** Do NOT change any of the gauge settings, UNLESS you are completely sure of what you are doing. Any changes you make could potentially cause you NOT to collect pressure data. Please contact **Scott Ager** for help.

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Doing a Grease Gun Test
<u>BEFORE</u> the JOB

Grease Gun Test Before the JOB

◦ You should ALWAYS <u>test</u> the Gauge, Pressure Sensor, and Battery Packs to verify the proper operation of the gauge <u>before</u> your Job.

◦ This is done by injecting a pressure pulse into the gauge, using a grease gun.

◦ You can generate approximately 3000-4000 PSI by quickly, and firmly, squeezing down on a grease gun handle.
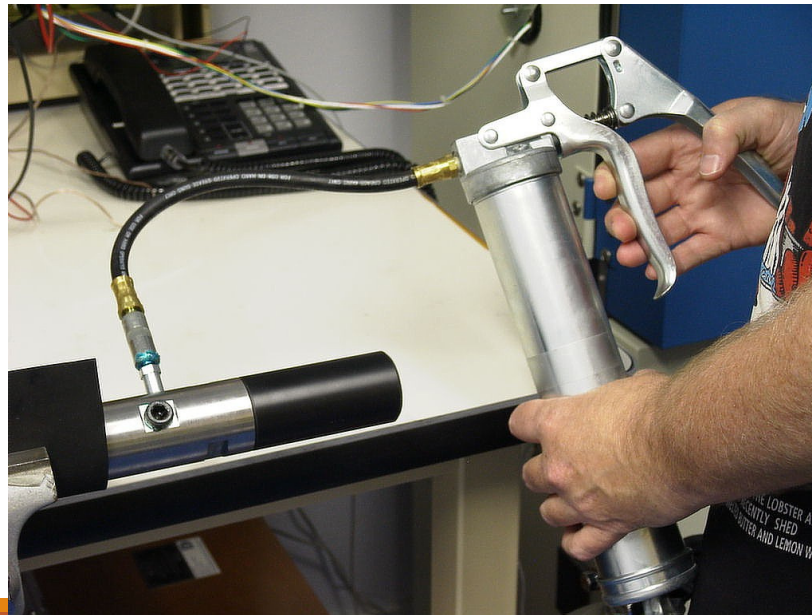
Grease Gun Test Procedure

◦ Unscrew and remove the 1/8" NPT grease gun port PLUG, and replace it with a grease gun nipple.

◦ Unscrew and remove both hollow lock nuts holding the micro screens in place.

◦ Leave the washers and micro screens installed, and then screw the solid lock nuts (with the FLAT bottoms supplied in the gauge tool box), *in place of* the hollow lock nuts. This will seal the grease inside the pressure ports.

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Grease Gun Test Procedure

◦ Install the Battery Fixture inside the gauge, and remove the RED Kill Switch, to turn on the gauge.

◦ Connect the gauge to the computer, and make LINK (it might take 15-30 seconds). Clear any Error Flags.

◦ Program the gauge using the standard settings the gauge came with.

NOTE: You probably can use your current gauge settings. Try this first...

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Grease Gun Test Procedure

◦ In the START/STOP menu, manually START the gauge.

◦ After the screen is flashing is RECORDING DATA, then disconnect the gauge from your computer.

  ◦ Note: If you are not using a battery fixture, you cannot disconnect the OWR section from the Interface Box without losing power. You must first EXIT the OWR software, then unplug the Interface Box from the computer.

◦ Wait 1 minute, then connect the grease gun to the grease gun nipple, and squeeze the grease gun as hard as you can, for 10 seconds.

◦ Wait 10 more seconds, then **loosen** the grease gun nipple with a wrench, to release the pressure.

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Grease Gun Test Procedure

◦ Connect the gauge back up to the computer, and after it makes link, manually STOP the gauge if you need to (in the START/STOP menu)

◦ After the gauge is SLEEPING, do a QUICK Download of the data, and display the data.

◦ You should see the pressure pulse from the grease gun, and it should go into FAST Speed.

◦ Be sure you re-install the hollow lock nuts in the pressure ports.
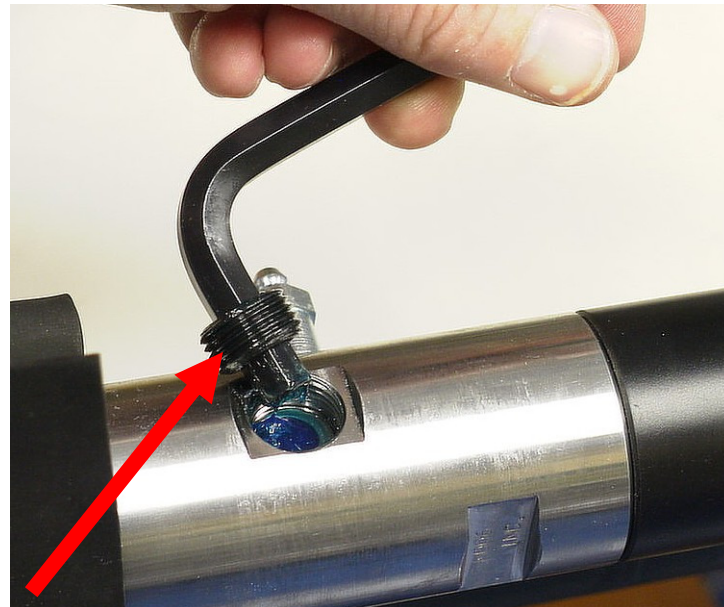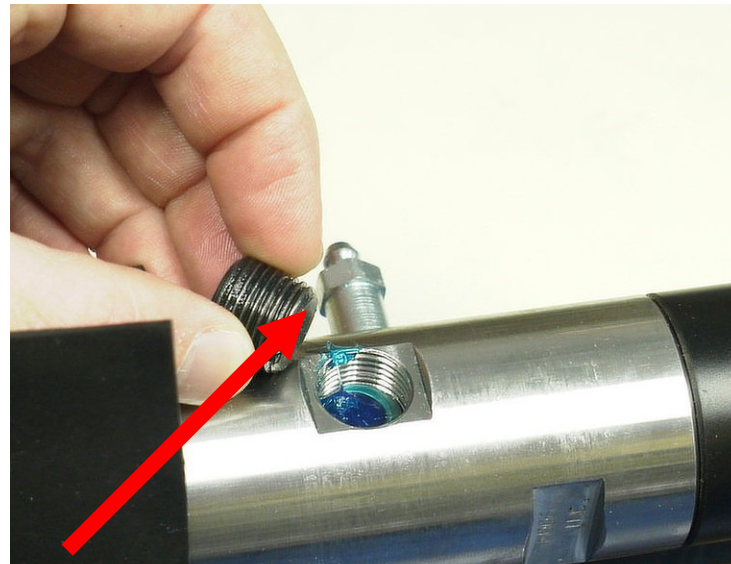
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Grease Gun Test Procedure
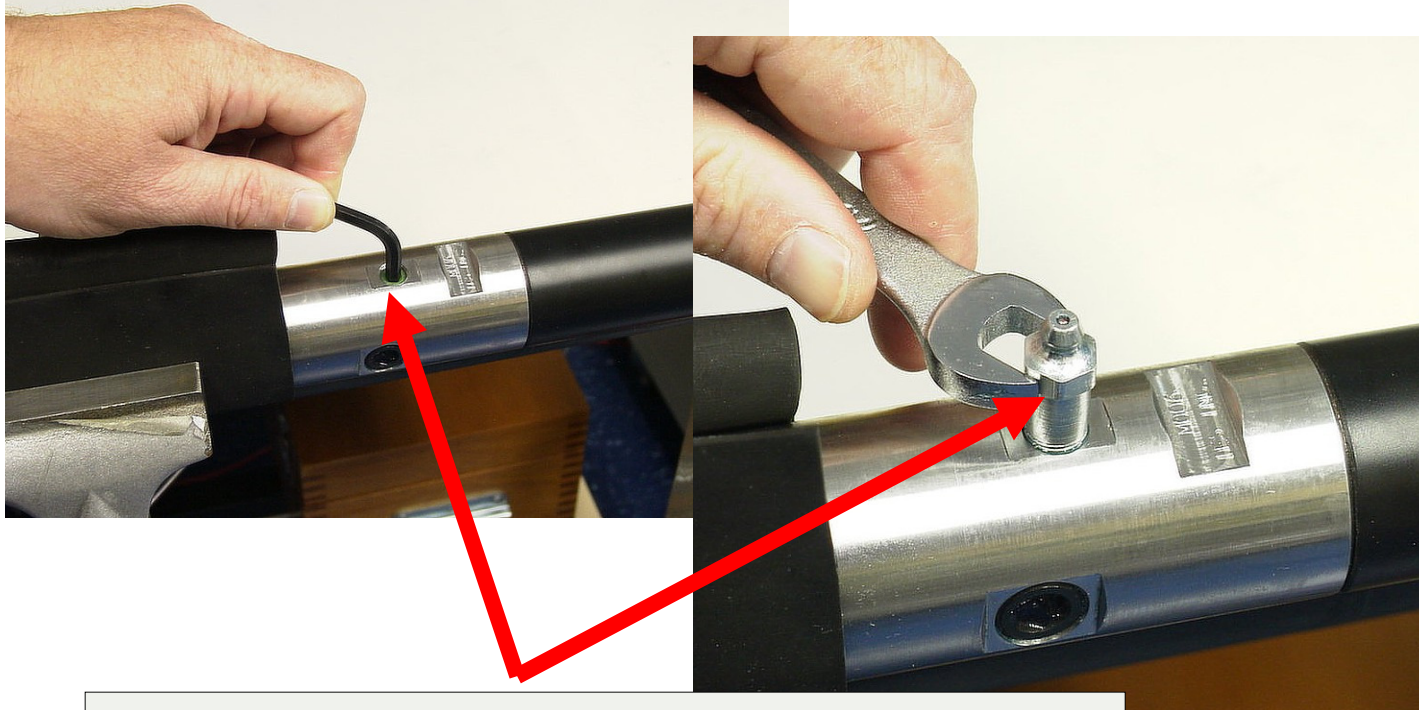
Remove the 1/8" plug, and install the grease gun nipple. Tighten the Nipple with a wrench.

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Grease Gun Test Procedure

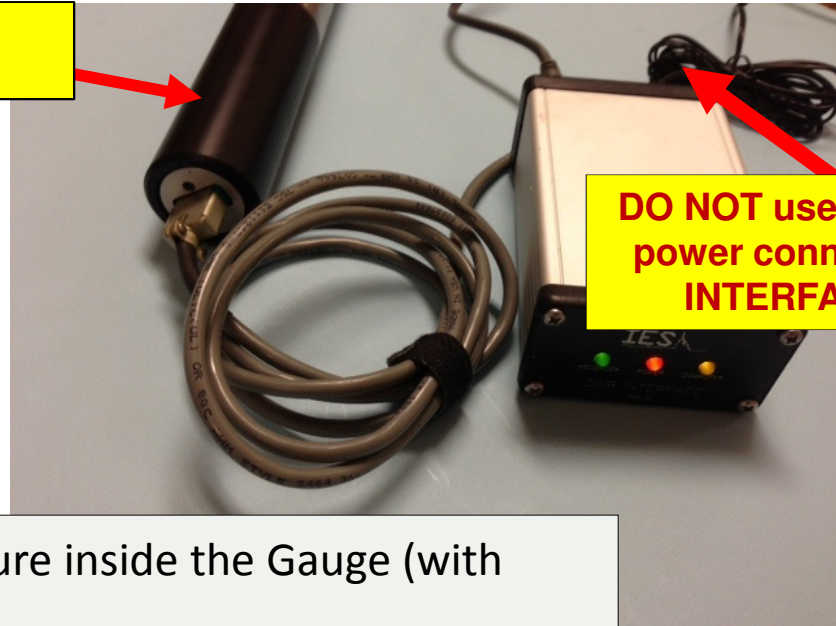Remove both hollow lock nuts, but leave the washers and micro screens in place

Grease Gun Test Procedure

Install the SOLID lock nuts, supplied with the gauge tool box, but leaving the washers and micro screens in place

Grease Gun Test Procedure

Battery Section

DO NOT use any external power connected to the INTERFACE BOX!

- Install the Battery Fixture inside the Gauge (with thread protector)

-disconnect the "RED Kill Switch",

-Then connect the gauge to the interface box (no external power) and computer, and make **LINK.** *It may take up to 30 seconds…*

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Grease Gun Test Procedure

When you <u>FIRST</u> install new batteries into the gauge, and initially make link to the gauge, you will always get a "POWER INTERRUPTION" error. *This is NORMAL.*

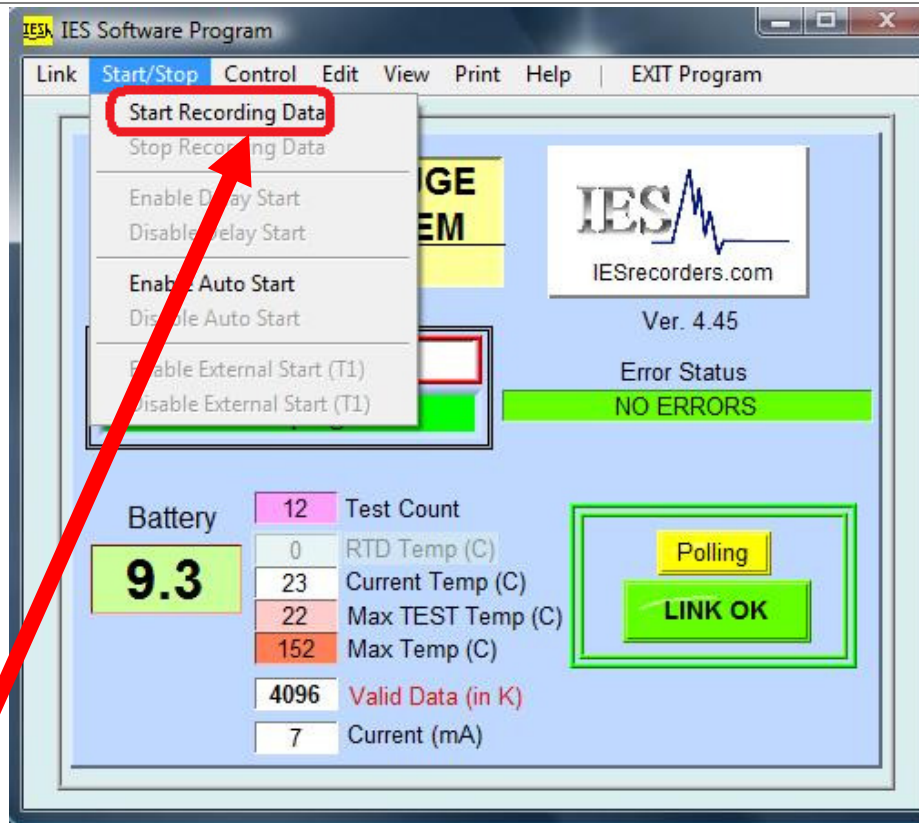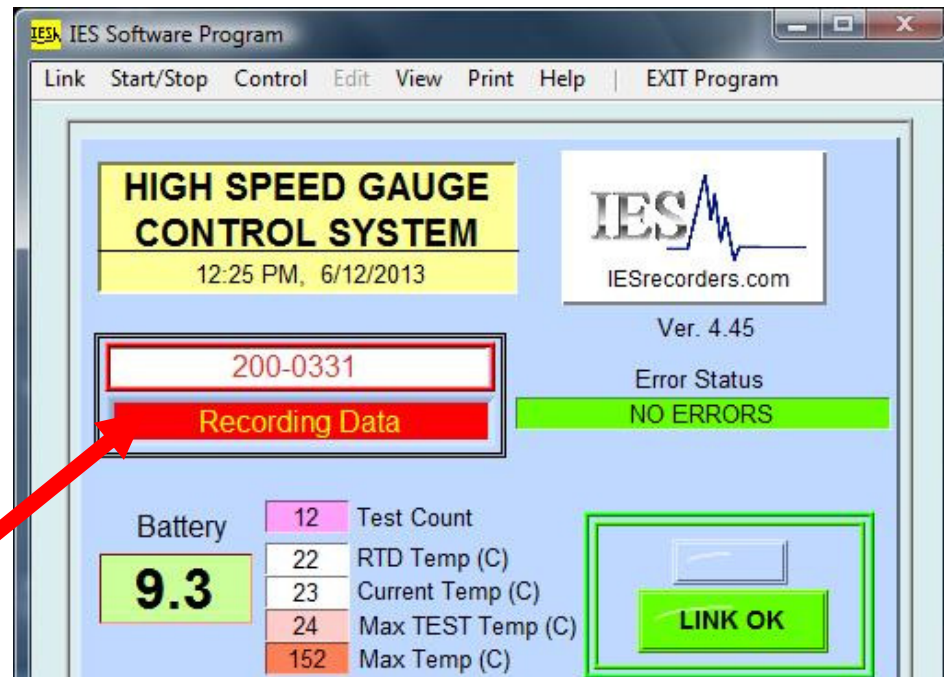Go to the CONTROL menu and select "Clear Error Flags" to clear the error.

Grease Gun Test Procedure

Manually START the gauge

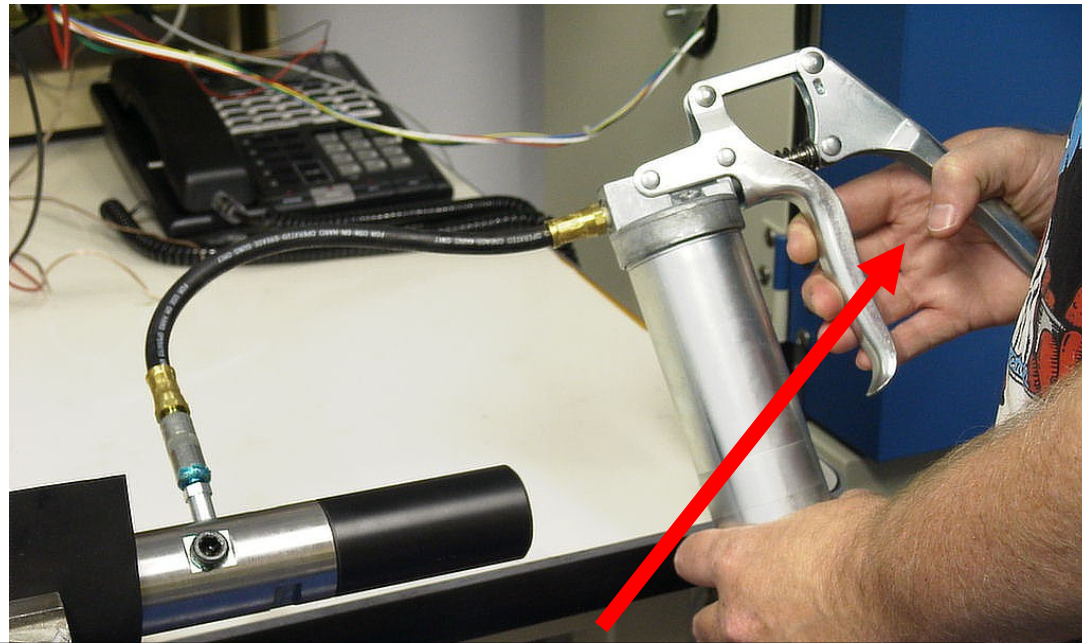# Grease Gun Test Procedure

-The gauge will <u>first</u> test the sensors and voltages…

-Wait until the MAIN screen is flashing <u>RECORDING DATA</u>,

- *Then <u>disconnect</u> the gauge from the Interface Box*

Grease Gun Test Procedure

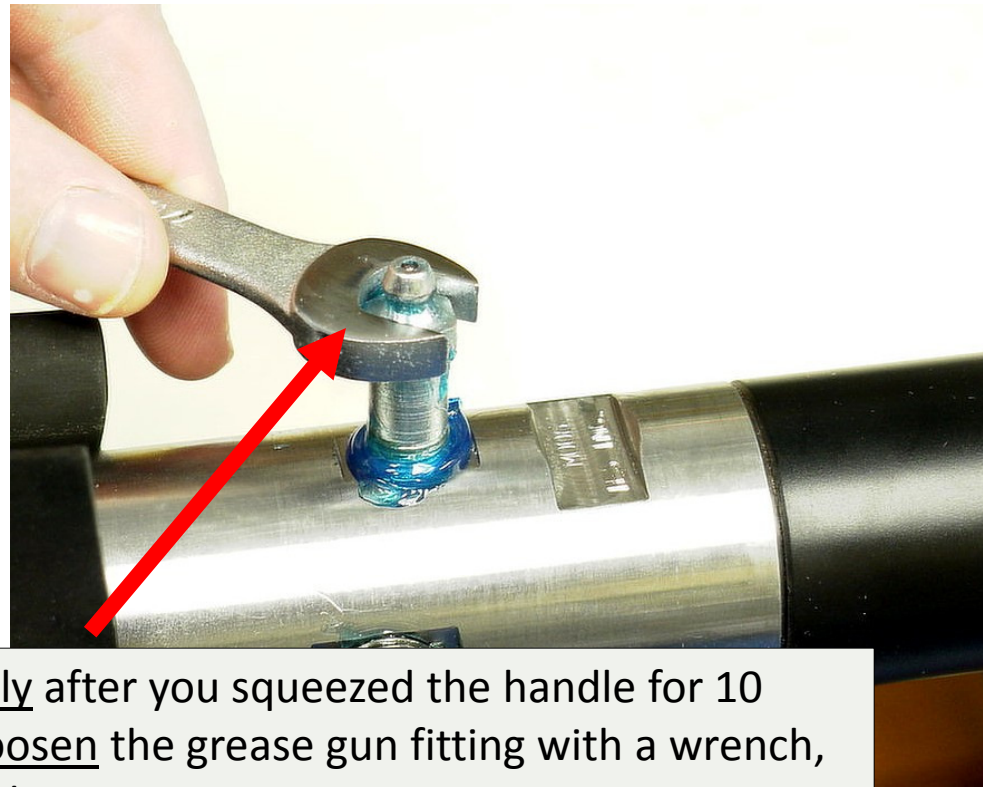-Connect the grease gun to the nipple on the gauge

-Wait 1 minute,

-THEN squeeze/pump the grease gun handle as hard as you can, for 10 seconds

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Grease Gun Test Procedure

Immediately after you squeezed the handle for 10 seconds, loosen the grease gun fitting with a wrench, to release the pressure

Grease Gun Test Procedure

Re-connect the gauge to the interface box and the computer

Grease Gun Test Procedure
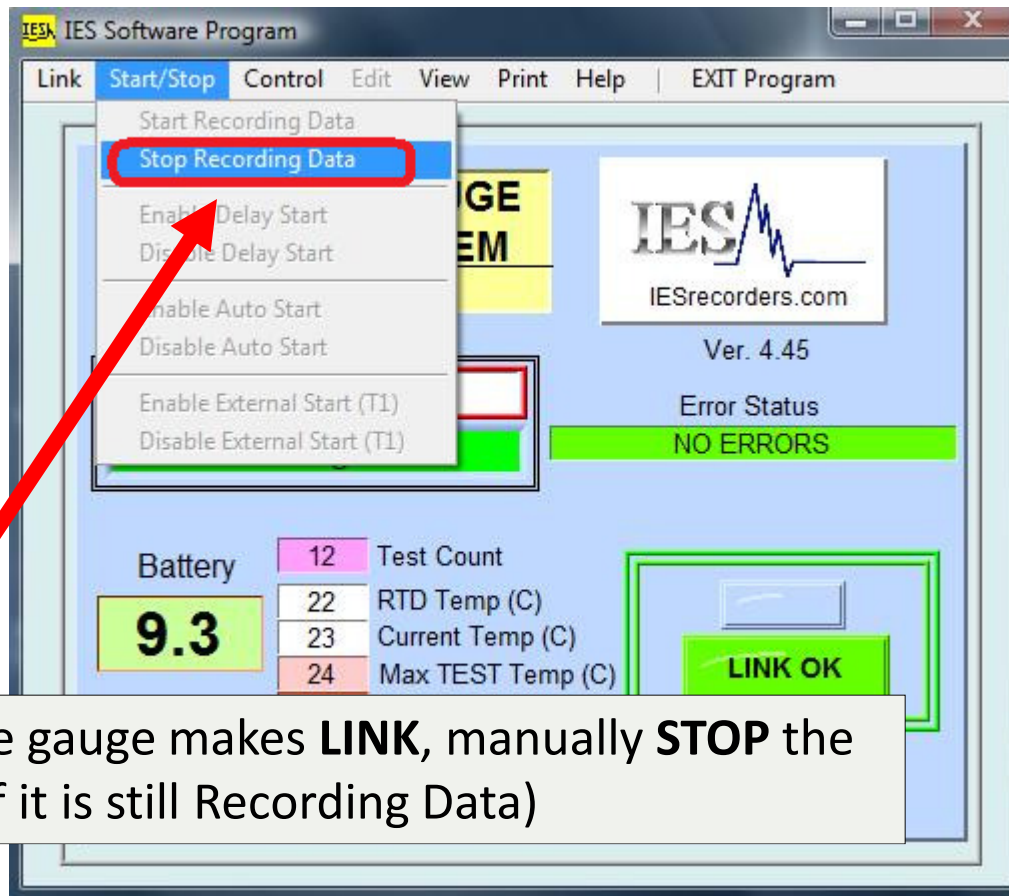
After the gauge makes **LINK**, manually **STOP** the gauge (if it is still Recording Data)

Grease Gun Test Procedure
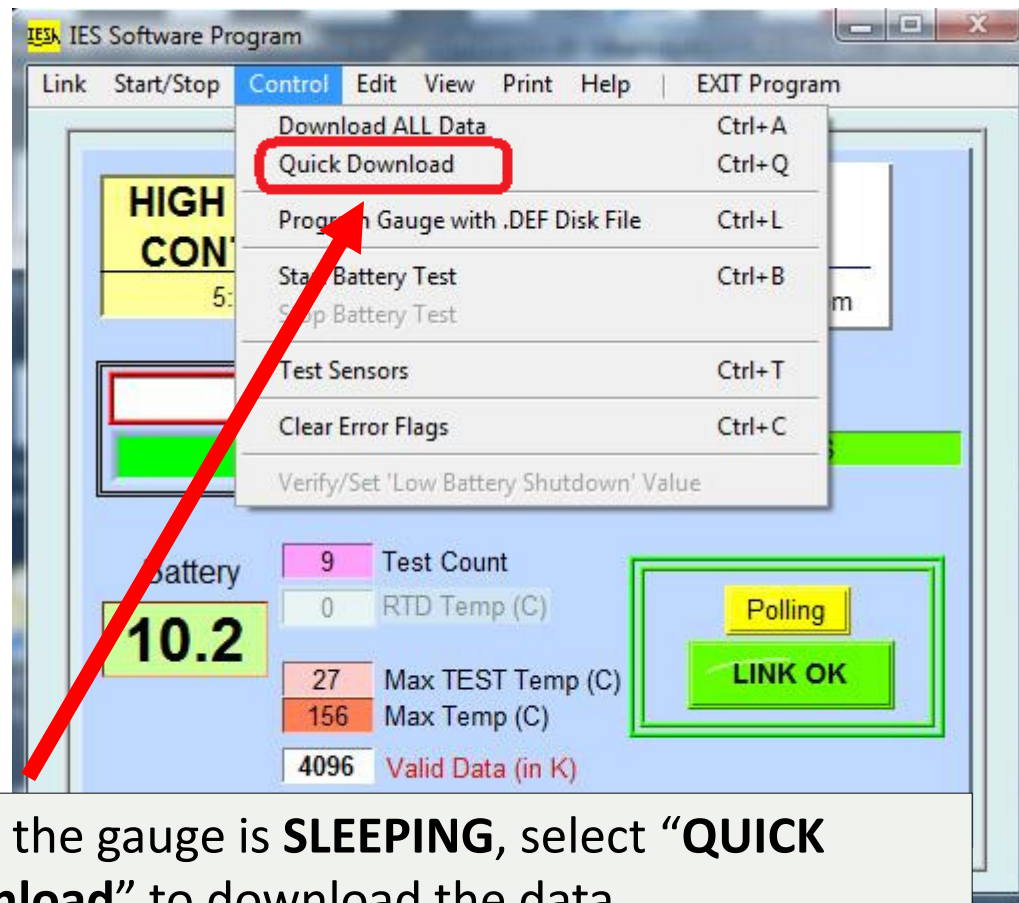
Once the gauge is **SLEEPING**, select "**QUICK Download**" to download the data

Grease Gun Test Procedure

Pressure Pulse from Grease Gun

Gauge goes into FAST Speed
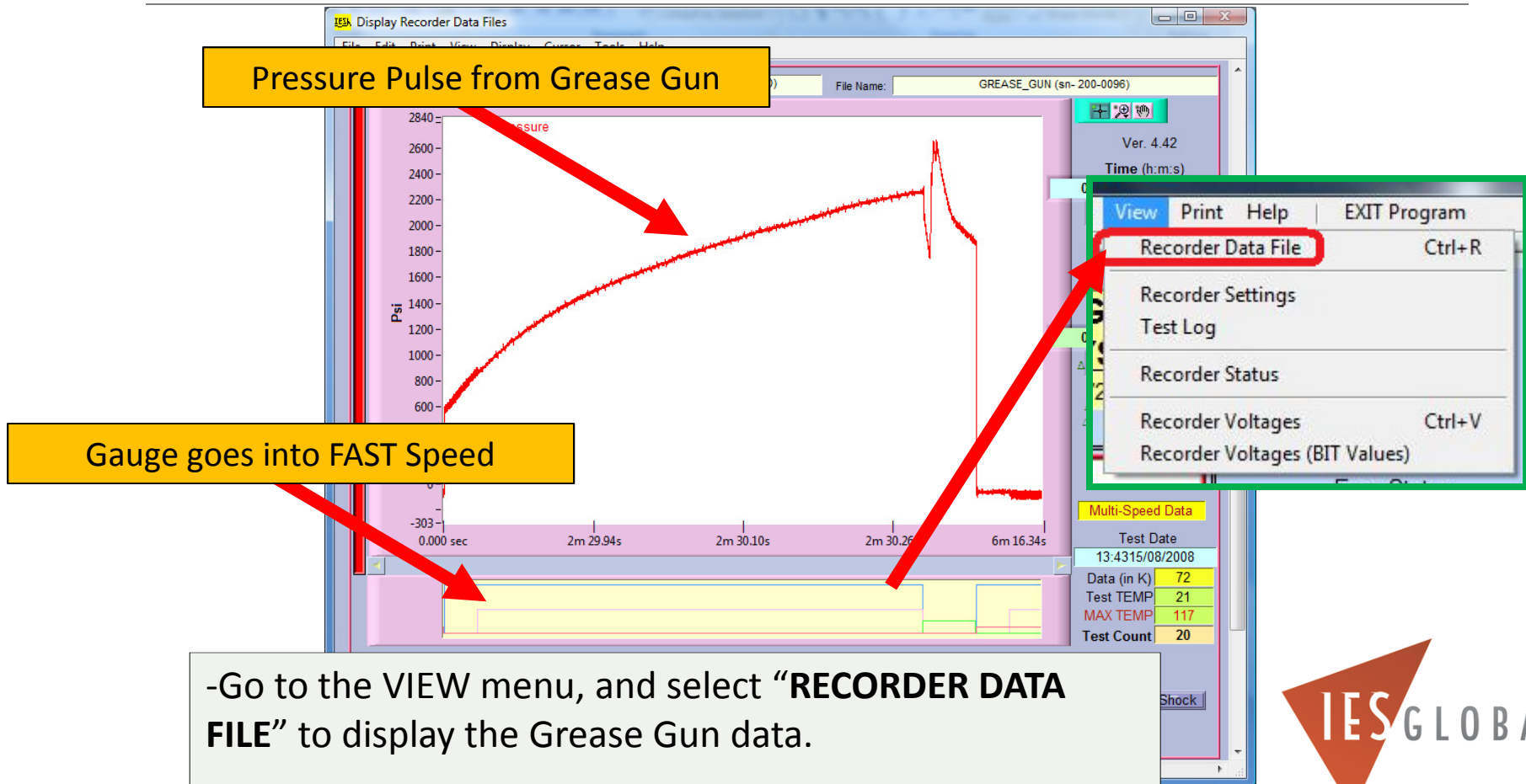
-Go to the VIEW menu, and select "**RECORDER DATA FILE**" to display the Grease Gun data.

-You should the pressure pulse from the grease gun, and the gauge should go into FAST speed

Grease Gun Test Procedure

Be sure to re-install both

hollow lock nuts!!!

IMPORTANT!

Procedures to Enable the Gauge to START <u>before</u> Running the Gauge into your Well.

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Make LINK to the Gauge

Battery Section

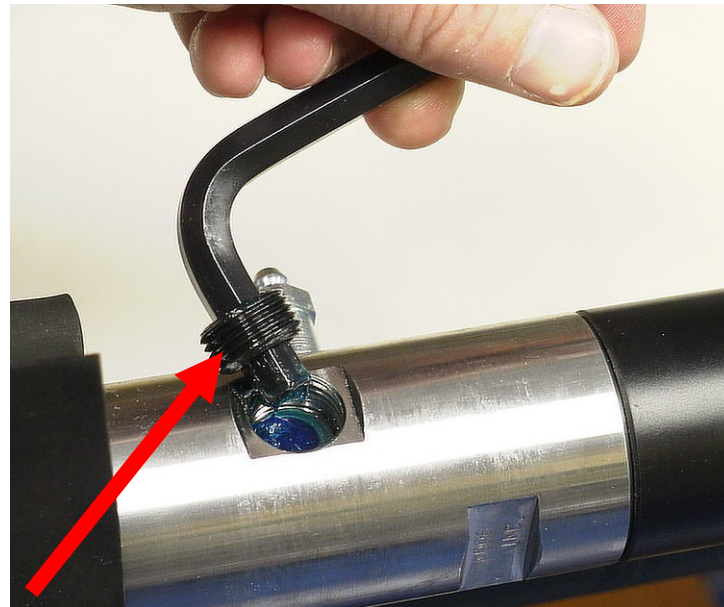**DO NOT use any external power connected to the INTERFACE BOX!**

- Be sure the Battery Fixture(s) are installed inside the Gauge (with thread protector)

-Disconnect the "RED Kill Switch",

-Connect the gauge to the Interface Box (Do NOT use external power) and computer, and make **LINK.** *It may take up to 30 seconds...*

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Make LINK to the Gauge

- Clear any ERROR Flags on the Screen.
- There should be no errors on the screen.
- The Gauge should be in the **SLEEPING** mode.
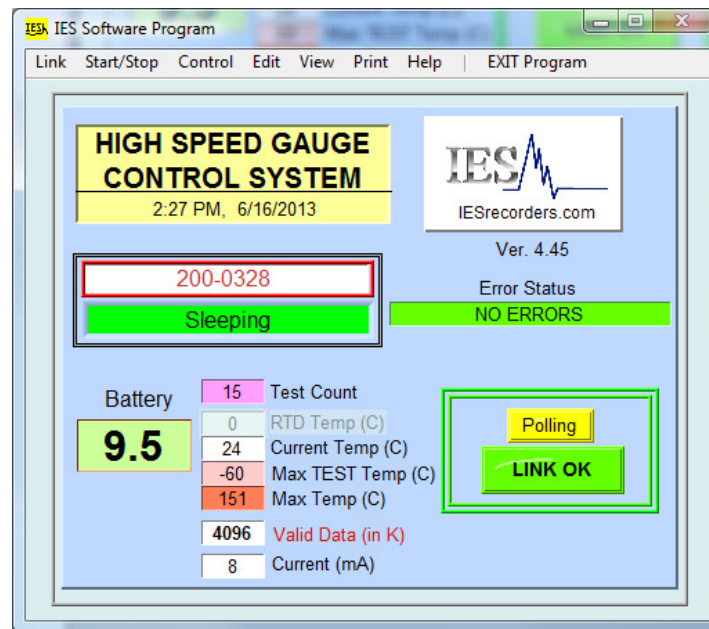
Review your Gauge "Settings"

○ Go to **EDIT**, **RECORDER SETTINGS**, to verify the settings programmed in the gauge are correct.

○ *PRINT a copy of this "Recorder Settings" screen for your records.*
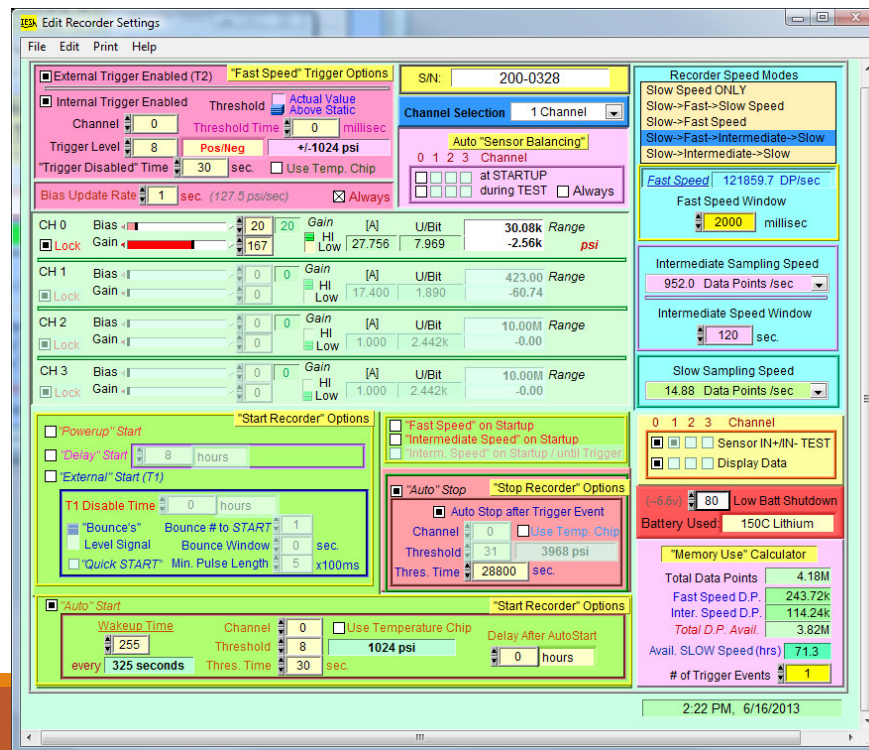
Review your Gauge "Channel Data" Information

◦ Go to **EDIT**, **RECORDER CHANNEL DATA,** to verify the information you entered in the **YELLOW** boxes is programmed correctly in the gauge.

◦ **PRINT** *a copy of this "Channel Data" screen for your records.*
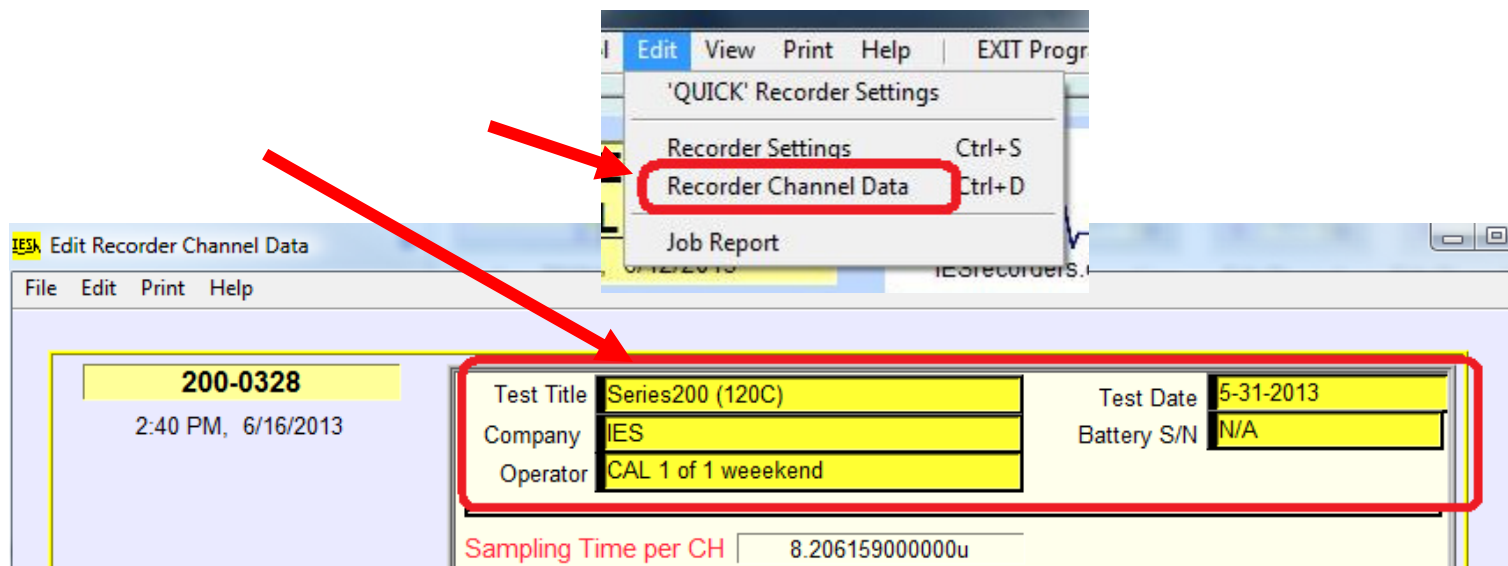
Tell the Gauge how you want it to START for your JOB

◦ ***BEFORE you run the gauge into the well, you must <u>select</u> how you want to <u>START</u> the gauge recording data for your JOB.***

◦ There are TWO options which are normally used for Starting the gauge RECORDING DATA before running it downhole…

◦ The **FIRST option** used to START the gauge for your job is the **AUTO START ENABLED** (<u>RECOMMENDED</u>) mode. This is what I normally suggest using. To set up the gauge to work with the AUTO START, you MUST first go to the START/STOP menu, and select ENABLE AUTO START.

◦ The **SECOND option** that can be used to START the gauge for your job is the MANUALLY START mode. This must happen just before you run the gauge into your well.

◦ ***IMPORTANT**: You must use one of these methods to START the gauge before it is run into the well, or the gauge will not collect any pressure data.*

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AUTO START" Option (Recommended)

Using the AUTO START Option for Starting the Gauge

◦ The recommended way to START the gauge, is to use the **AUTO START** mode.

◦ In this mode, the gauge wakes up once every 5-6 minutes and looks at the well pressure. If the pressure has exceeded the programmed AUTO START PRESSURE, the gauge will START recording data in SLOW speed. Otherwise, it will go back to sleep for another 5-6 minutes.

◦ This saves battery power and memory, and prevents the gauge from the false triggering into fast speed while RIH.

◦ The AUTO START PRESSURE setting is normally programmed for ~1000 psi below the static downhole pressure where the gauge is located

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Review your Gauge Settings

◦ If you are using the **AUTO START feature** to START the gauge downhole, be sure that this mode is first _ENABLED_ in the RECORDER SETTINGS menu.

◦ Be sure the correct AUTO START PRESSURE threshold is entered. This should be approximately ~_1000 psi below_ the static well pressure where the gauge is located downhole.

◦ The "Wakeup Time" should be set to "255", and the "Threshold Time" should be set to "30 seconds".
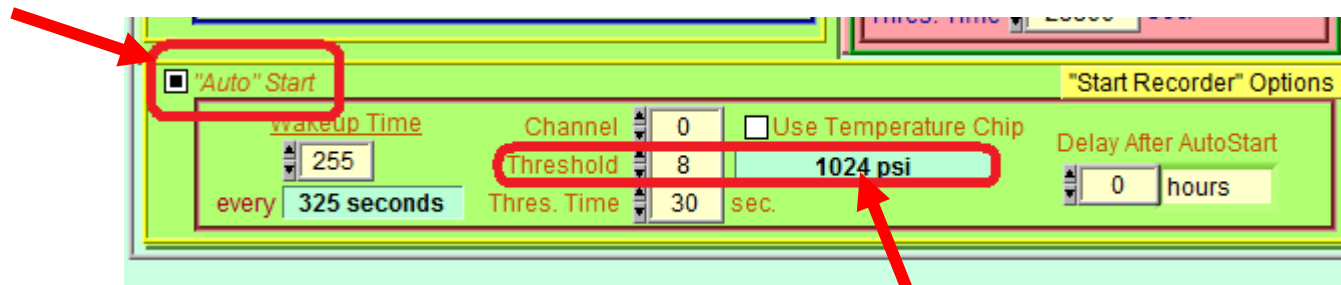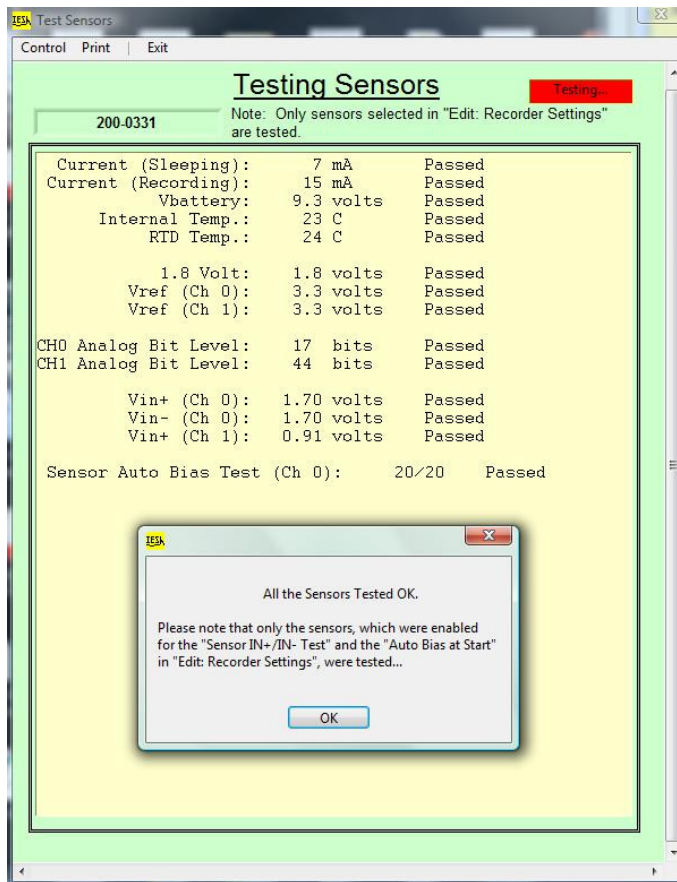
Using the <u>AUTO START</u> Option for Starting the Gauge

◦ *If you choose to use this <u>AUTOSTART</u> option...* <u>Before</u> you run the gauge into the well, YOU <u>MUST</u> FIRST go to the **START/STOP** menu, and select the option **ENABLE AUTO START**.
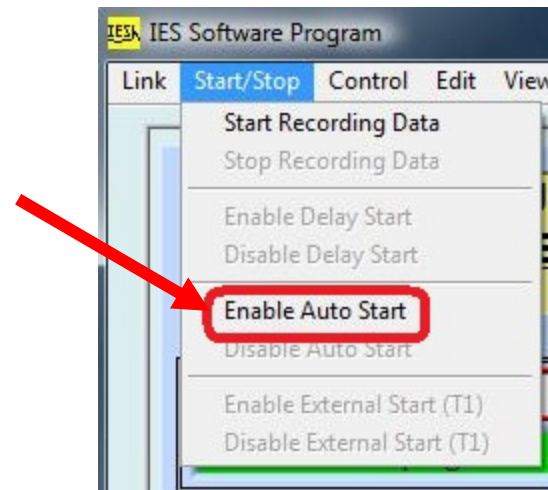
Using the <u>AUTO START</u> Option for Starting the Gauge

After you select the ENABLE AUTO START option, the gauge will check the batteries and sensors, first. *This will take a few minutes.*

Be sure that you have the EXTERNAL POWER <u>disconnected</u> from the Interface Box BEFORE the sensor test is performed.

The Sensor Test should PASS with no errors.

Using the <u>AUTO START</u> Option for Starting the Gauge

◦ PLEASE patiently wait while the gauge finishes setting itself up for recording data. *This may take a couple minutes.*

◦ When the MAIN screen is flashing **AUTO START ENABLED**, then you can <u>disconnect</u> the gauge from the interface box
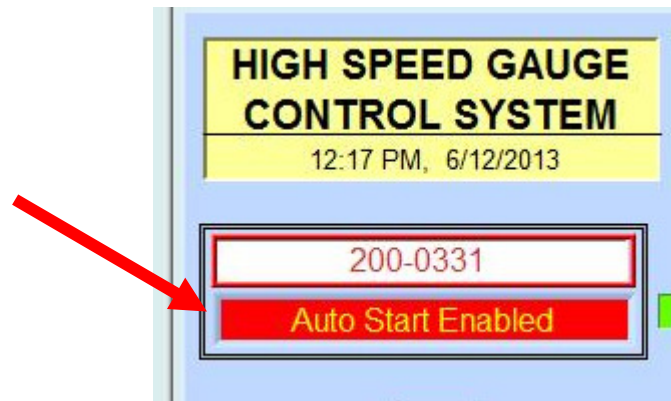
Using the AUTO START Option for Starting the Gauge

- ◦ **Important:** *PRINT a copy of MAIN screen showing that the gauge is in the "AUTO START ENABLED" mode for your records.*
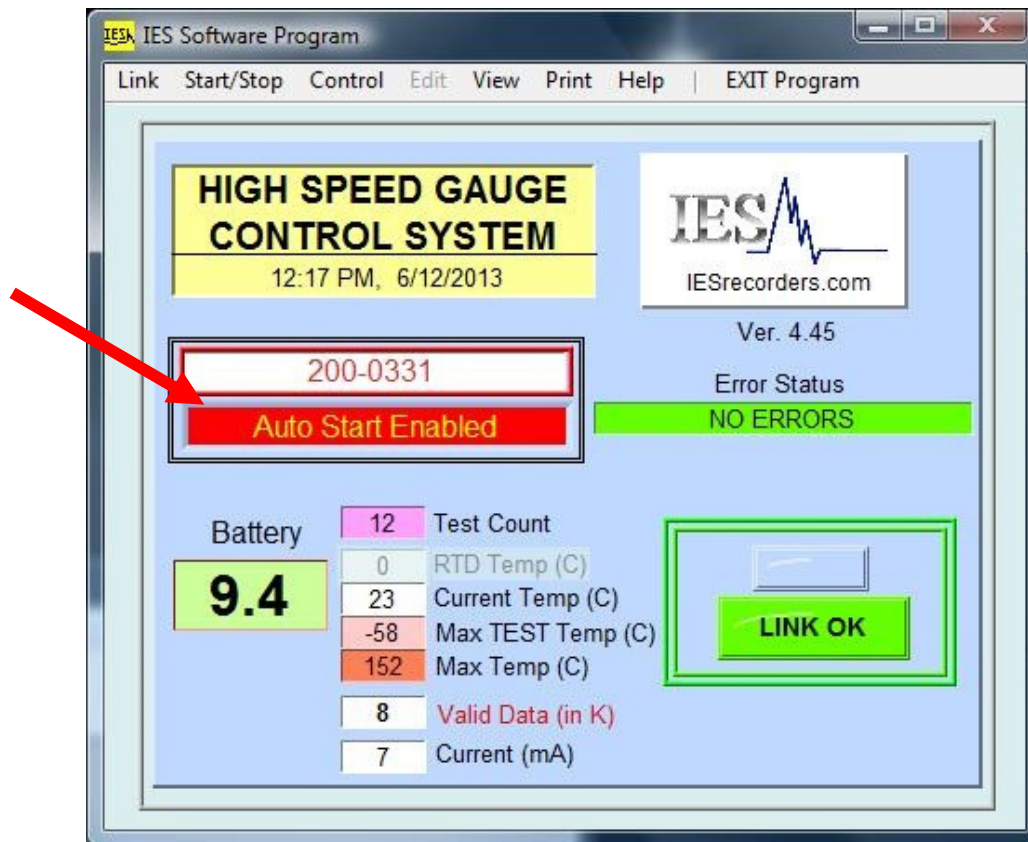
# Plug in the RED KILL SWITCH, if you are not running the gauge into the well <u>at this time</u>.

◦ If you don't plan on running the gauge into your well at this time, plug-in the RED KILL SWITCH back into the battery fixture to turn off the gauge.

◦ *This will turn OFF the gauge and save the battery power, until just before your JOB.*

◦ *IMPORTANT! If you run the gauge in the well with the RED KILL SWITCH <u>installed</u>, the gauge will not start, and you will not collect data.*
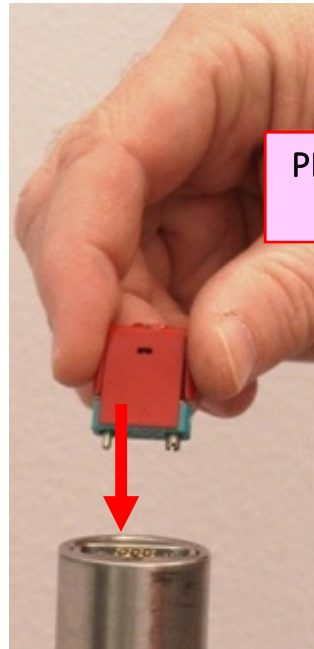
PLUG the RED KILL SWITCH into the battery fixture.

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Connect the DATA READOUT SECTION to the BATTERY SECTION

◦ Next, <u>install</u> the **DATA READOUT SECTION** and **BATTERY SECTION** together for storing the gauge. This will prevent dirt and moisture from getting inside the gauge before your JOB.

◦ Be sure the **RED KILL SWITCH** is <u>installed</u>!

◦ **<u>ONLY Hand Tighten</u>** the two gauge sections together. *DO NOT USE ANY WRENCHES TO TIGHTEN THE GAUGE TOGETHER!*
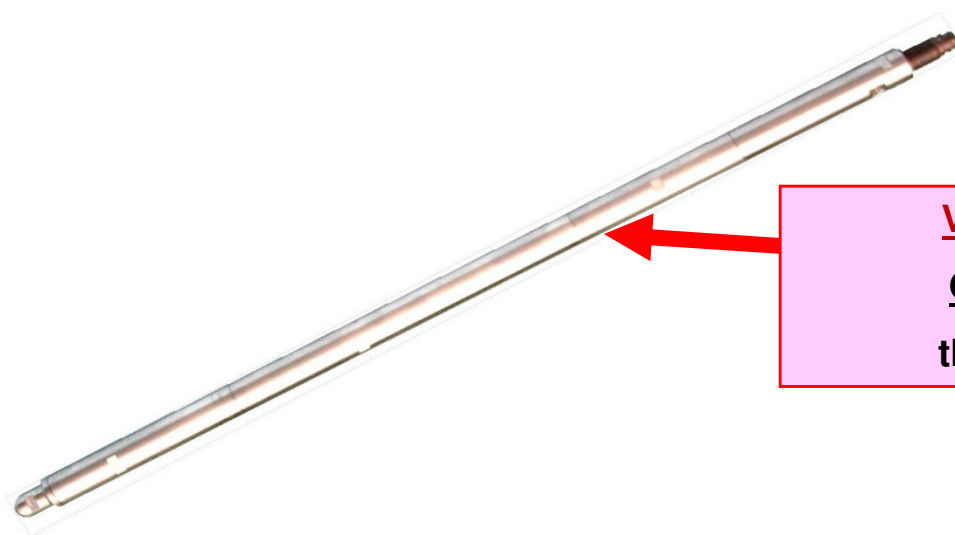

VERY IMPORTANT!!!

<u>ONLY Hand-Tighten</u> the DATA READOUT and BATTERY Section!!

Do NOT torque the gauge to more than 50 foot-pounds!

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The Gauge is now ready to store until just before your JOB

Now, the gauge power is turned OFF (with the RED KILL SWITCH installed) and sealed for storage, until you are ready for your JOB.

VERY IMPORTANT!!!

ONLY Hand-Tighten

the Gauge Sections!!

*Do NOT torque the gauge sections to more than 50 foot-pounds!

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At your JOB Site...

# When you are at your JOB site, just <u>before</u> you run the Gauge in the Well...

- ◦ Remove the DATA READOUT SECTION, and **PULL** the RED KILL Switch at your job site.
- ◦ The gauge will automatically start up again in the **AUTO START ENABLED** mode.
- ◦ *Note: You <u>DO NOT</u> need to connect the gauge to the computer at your job site.*

<u>PULL</u> the RED KILL SWITCH just before you are ready to run the gauge downhole.

This will start the gauge in the AUTO START ENABLED mode

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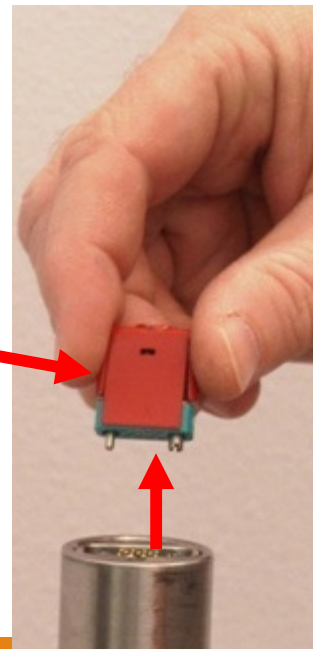
Re-Install the DATA READOUT SECTION back on the BATTERY SECTION

◦ Next, install the **DATA READOUT SECTION** back to the **BATTERY SECTION**.

◦ **ONLY Hand Tighten** the two gauge sections together. *DO NOT USE ANY WRENCHES TO TIGHTEN THE GAUGE TOGETHER!*

VERY IMPORTANT!!!

ONLY Hand-Tighten the DATA READOUT and BATTERY Section!!

IES GLOBAL
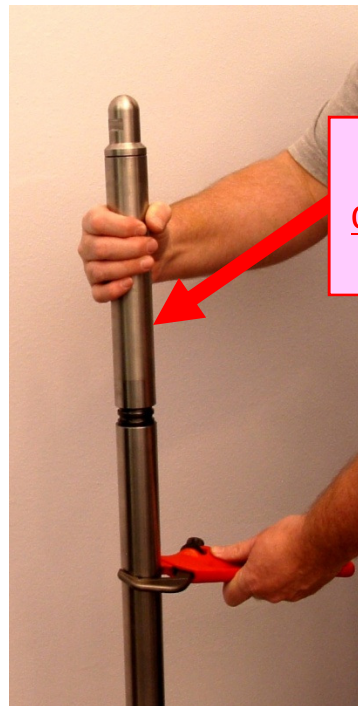
NEVER use a Wrench to tighten the Gauge Sections!

- ◦ **<u>IMPORTANT</u>: NEVER use any wrench to tighten the Gauge Sections together!!**
- ◦ **Use your hands ONLY!!   The gauge will stay together without using wrenches. If you use a wrench to tighten the Gauge Sections, you will <u>break</u> the BATTERY FIXTURE, resulting in a loss of your data….**
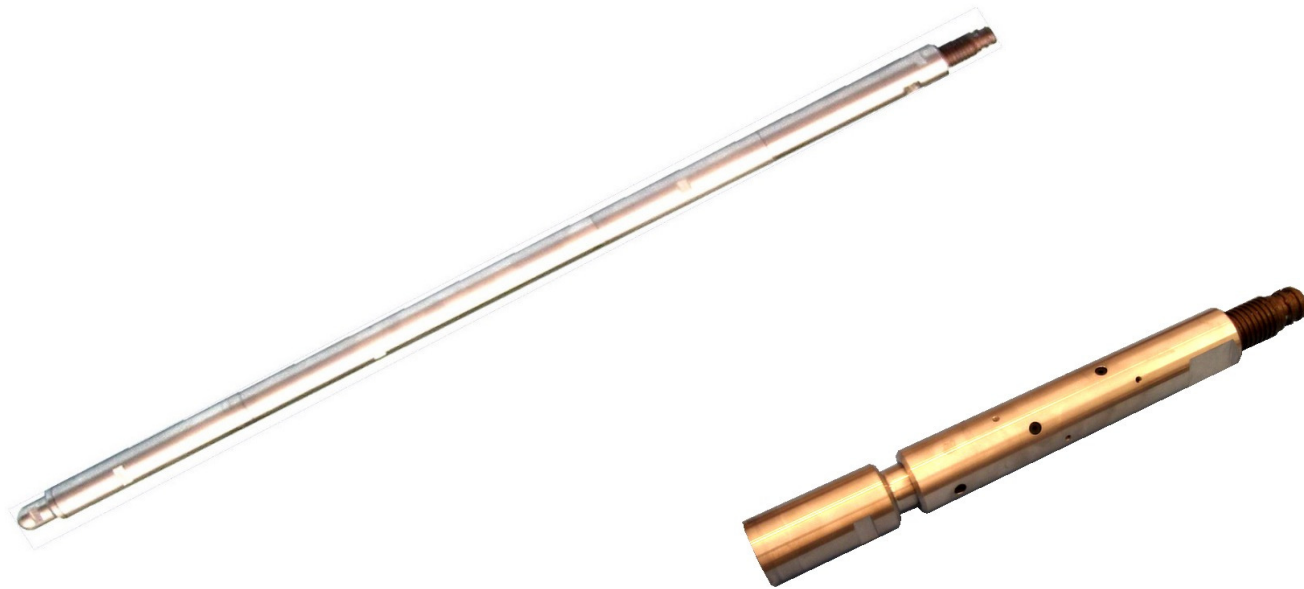
Never exceed 50 foot-pounds of Torque

NO!!!

IES GLOBAL

The Gauge is now ready to run downhole for your JOB

The gauge is <u>ready</u> to run downhole for your JOB.
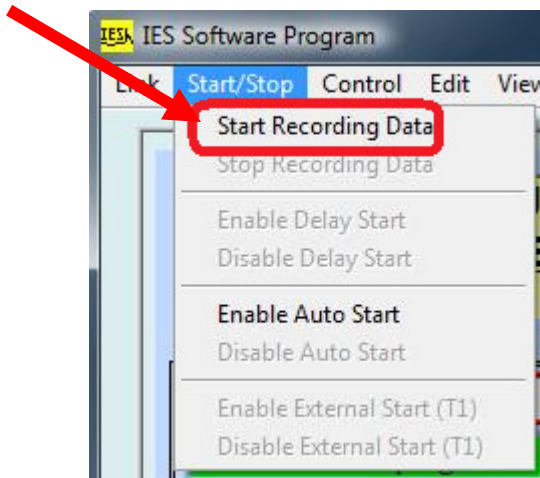

** Don't forget to install the Shock Mitigater
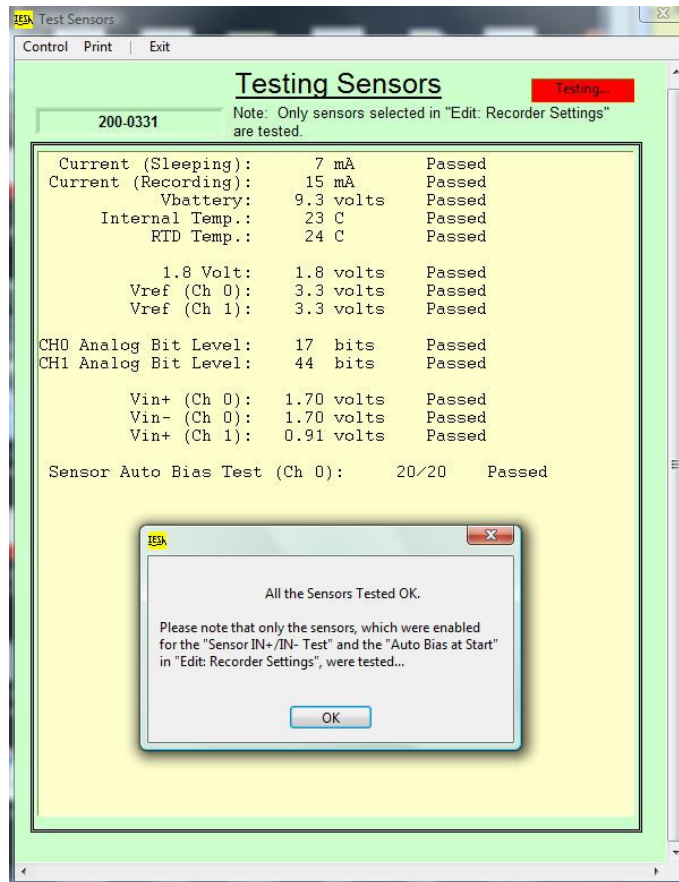
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*_MANUAL_ Start Option…

Using the <u>Manual START</u> Option for Starting the Gauge

◦ If you want to **_MANUALLY_ START** the gauge recording data in the SLOW speed mode at your JOB SITE immediately <u>before</u> running the gauge in the well...

◦ Go to the **START/STOP** menu, and select the option **START RECORDING DATA**.

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Using the Manual START Option for Starting the Gauge

◦ After you manually select START RECORDING DATA, the gauge will first check the batteries and sensors. *This will take a few minutes.*

◦ Be sure that you have the EXTERNAL POWER disconnected from the interface box BEFORE the sensor test is performed.

◦ **The Sensor Test should PASS with no errors**.

Using the <u>Manual START</u> Option for Starting the Gauge

◦ PLEASE patiently wait while the gauge finishes setting itself up for recording data. *This may take several minutes.*

◦ When the MAIN screen is flashing **RECORDING DATA**, then you can <u>disconnect</u> the gauge from the interface box
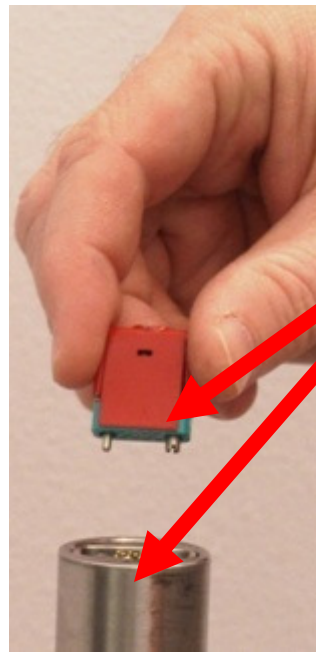
Using the <u>Manual START</u> Option for Starting the Gauge

◦ **Important:** **_PRINT_** *a copy of MAIN screen showing that the gauge is in the* **_"RECORDING DATA"_** *mode, for your records.*
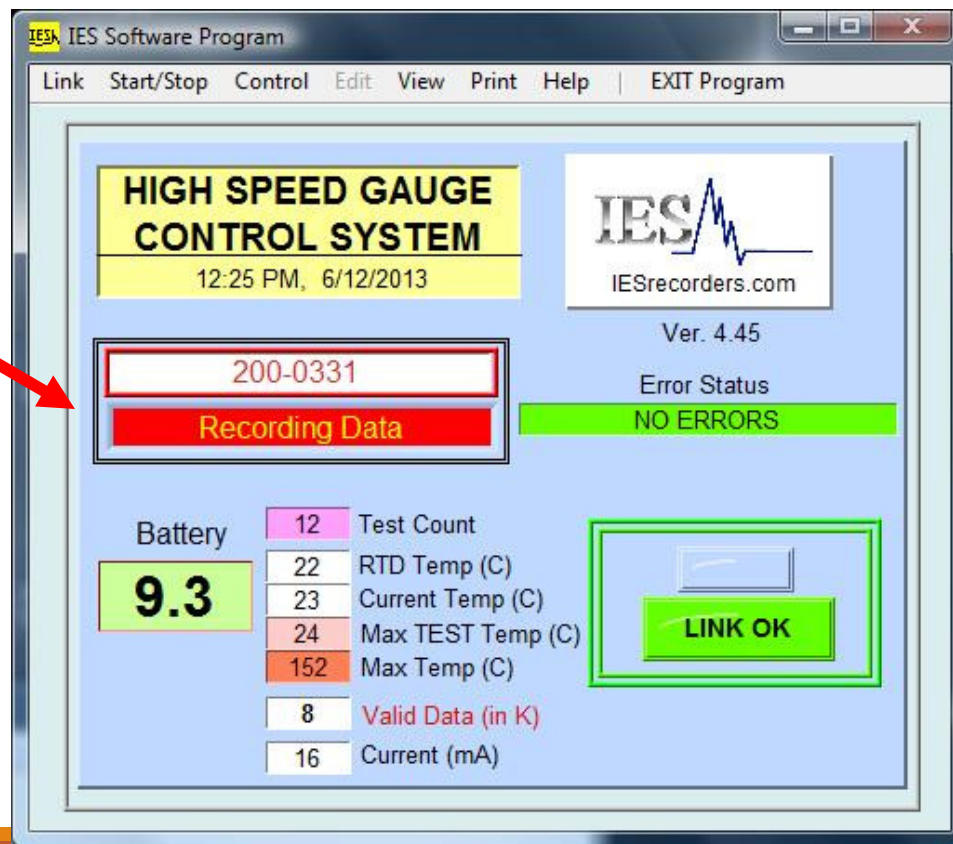
DO NOT install the RED KILL SWITCH!!!

◦ Do NOT install the **RED KILL SWITCH** when using the **Manual START**.

◦ If you do, you will turn OFF the gauge, and it will NOT record any data while its downhole….

NO!!!

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Install the DATA READOUT SECTION back on the BATTERY SECTION

◦ After the gauge has been STARTED, next, install the **DATA READOUT SECTION** to the **BATTERY SECTION**.

◦ **ONLY Hand Tighten** the two gauge sections together. *DO NOT USE ANY WRENCHES TO TIGHTEN THE GAUGE TOGETHER!*

VERY IMPORTANT!!!

ONLY Hand-Tighten the DATA READOUT and BATTERY Section!!

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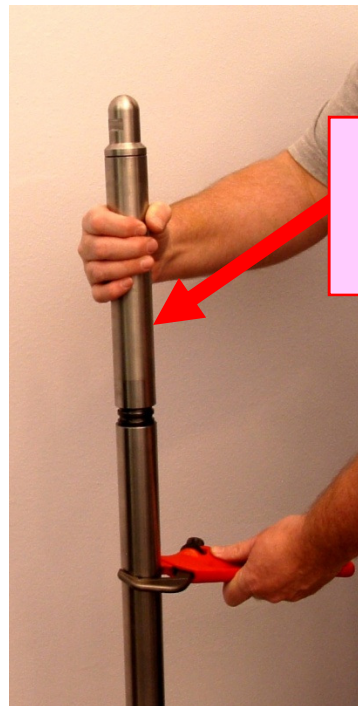
NEVER use a Wrench to tighten the Gauge Sections!

◦ **IMPORTANT: NEVER use any wrench to tighten the Gauge Sections together!!   Use your hands ONLY!!   The gauge will stay together without using wrenches. If you use a wrench to tighten the Gauge Sections, you could <u>break</u> the BATTERY FIXTURE, resulting in a loss of your data….**

Never exceed 50 foot-pounds of Torque

NO!!!

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The Gauge is now ready to run downhole for your JOB

The gauge is <u>ready</u> to run downhole for your JOB.

** Don't forget to install the Shock Mitigater

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Preparing the Gauge for a JOB

BY SCOTT A. AGER

IESGLOBAL