

## SCR Monitor Reset Procedure

V1.0

The JCB T4F engines with aftertreatment require periodically to be 'refreshed' which through elevated exhaust temperatures will remove most depositing of combustion byproducts restoring its ability to quickly add heat and decompose NOx into N2 and H2O.

A couple of things to remember about SCR Refresh and the JCB T4F engines:

- SCR refresh will automatically begin to occur around 92% on the SCR Monitor if not inhibited by the machine's interface/control panel. If inhibited, it will prevent even the Service Master tool from completing a refresh of the SCR.
- If SCR refresh is not completed successfully and the SCR Monitor gets to 95%, the machine will flag P3424 – SCR Partially Blocked.
- If the SCR refresh is still not completed successfully and the SCR Monitor gets to 97%, the machine will flag P3425 – SCR Fully Blocked.
- If the SCR Monitor gets to 98% without successfully completing a SCR Refresh, the machine will no longer allow a SCR refresh to occur automatically or stationary/manually and must have the SCR Monitor reset to below 98%
- If performing a SCR refresh on a JCB G-Drive unit (Generator IPU or JCB Generator) the machine MUST have a minimum of 30% load on the machine to complete the refresh. This is due to this model performing its refresh at a stationary 1800 RPM vs variable elevated RPM like in JCB machines and IPUs. External load must be applied at the time of SCR refresh via electrical loading.
- Only JCB IPUs and G-Drive units will have the ability to use Service Master to complete a stationary/manual SCR refresh at any point. All other JCB machines will only be able to complete this refresh via the machine's panel once the SCR Monitor reaches 92%.

## Resetting the SCR Monitor

To reset the SCR Monitor to below 98% to restore the machine's ability to perform an SCR refresh, we need to verify the SCR Monitor's percentage.

1. Open the JCB EcoMax Engine Diagnostics tool once connected to the machine and having the machine 'Keyed On'. See figure 1.

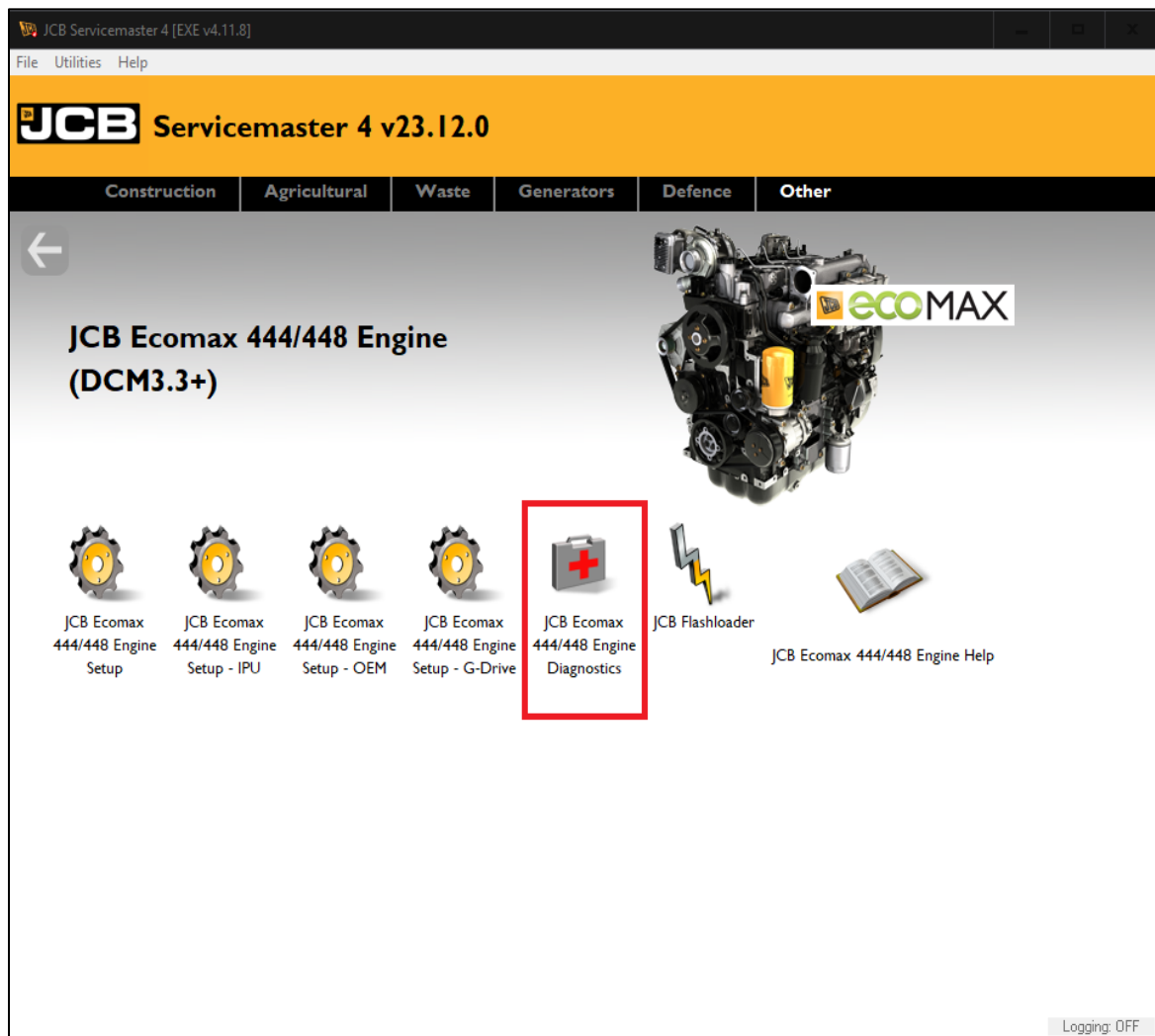


Figure 1

2. Once connected to the machine, navigate using the tabs across the top of the screens to 'Ecomax Actuators' and then on the second row of tabs, locate 'Actuator Resets'. Note the SCR Monitor value will be noted here and should be recorded. In this example it is 107.34%.

Also note if the 'SCR Monitor Reset' button is greyed out as shown in figure 2 below. Once this is noted, please close out the Ecomax Engine Diagnostic tool.

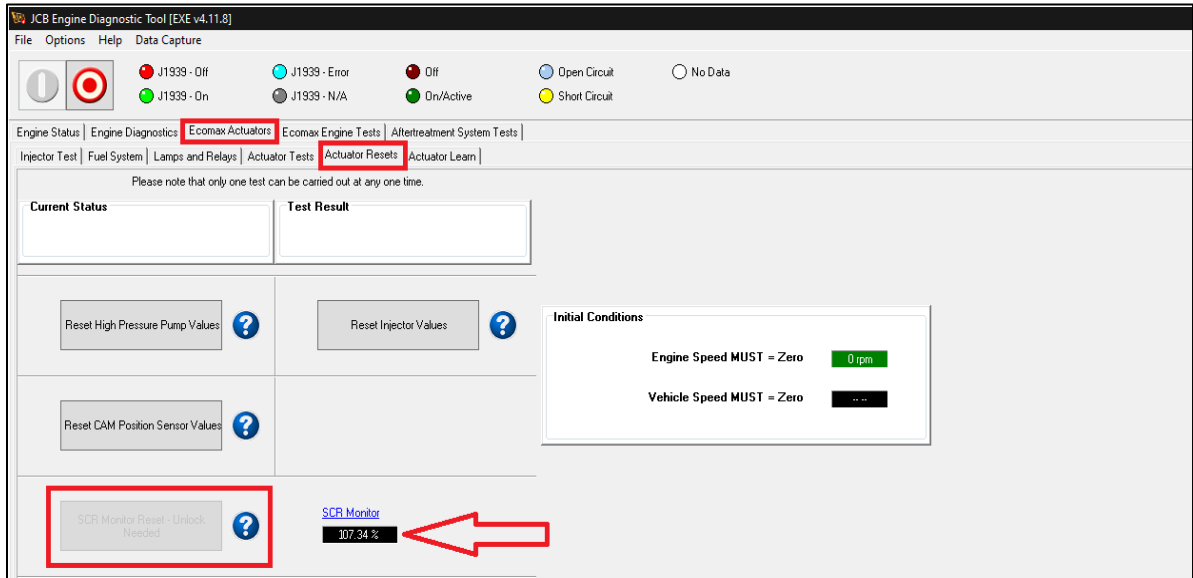


Figure 2

3. Find the appropriate EcoMax Engine Setup tool for the machine you are working on. If this is a machine such as Telescopic Handler or Backhoe Loader, please use the engine setup tool within those sections of the Service Master tool. In the example below, we will be using a G-Drive (Generator) machine, so the 'EcoMax 444/448 Engine Setup – G-Drive' tool will be used. See figure 3 below.

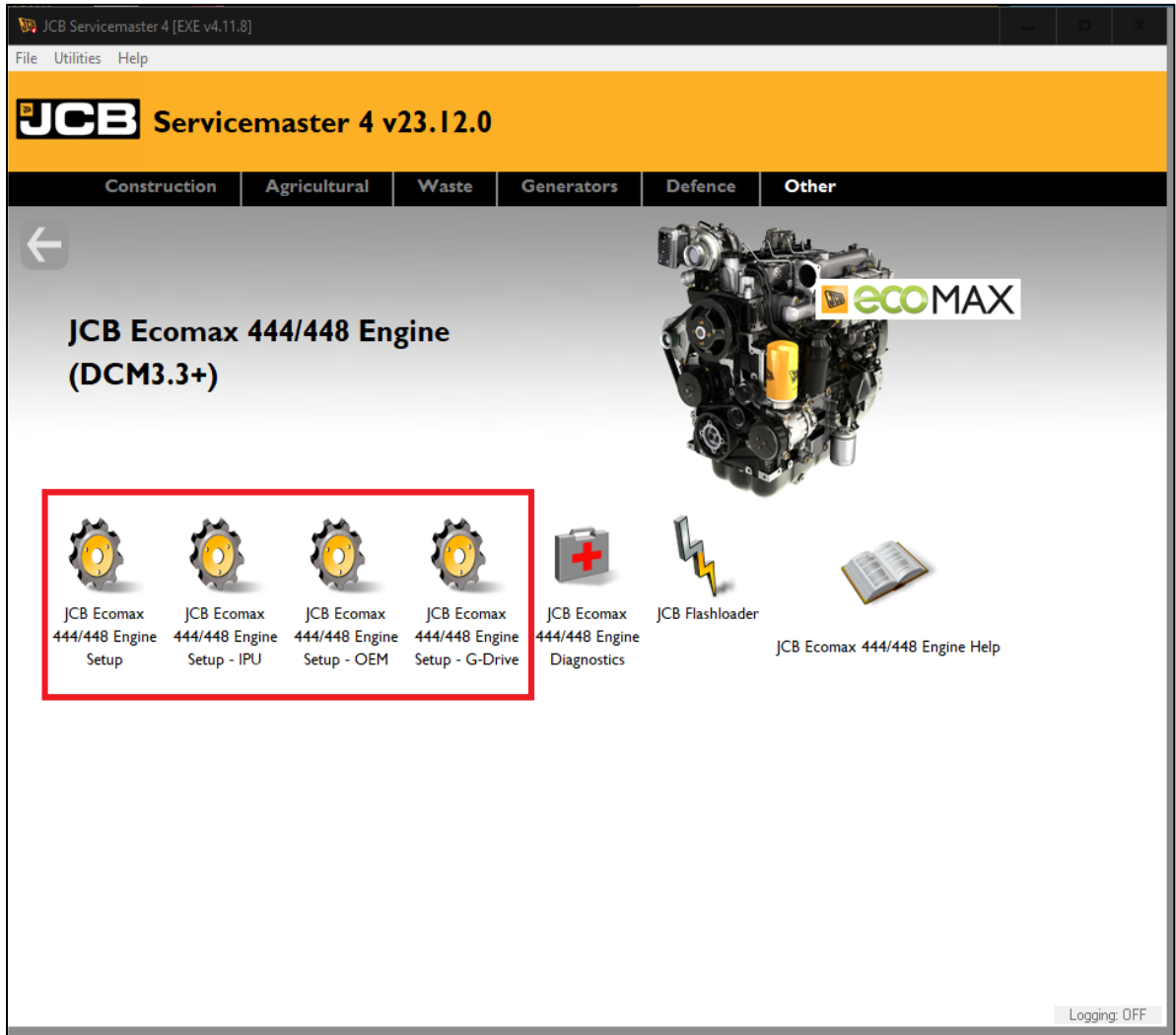


Figure 3

4. Open the tool with the machine 'Keyed On' and allow the tool to populate with the appropriate information. Once the tool is finished reading the engine ECM data, navigate to the 'Utilities' button on the top row and locate 'High Security Unlock' and click on it. See figure 4 below.

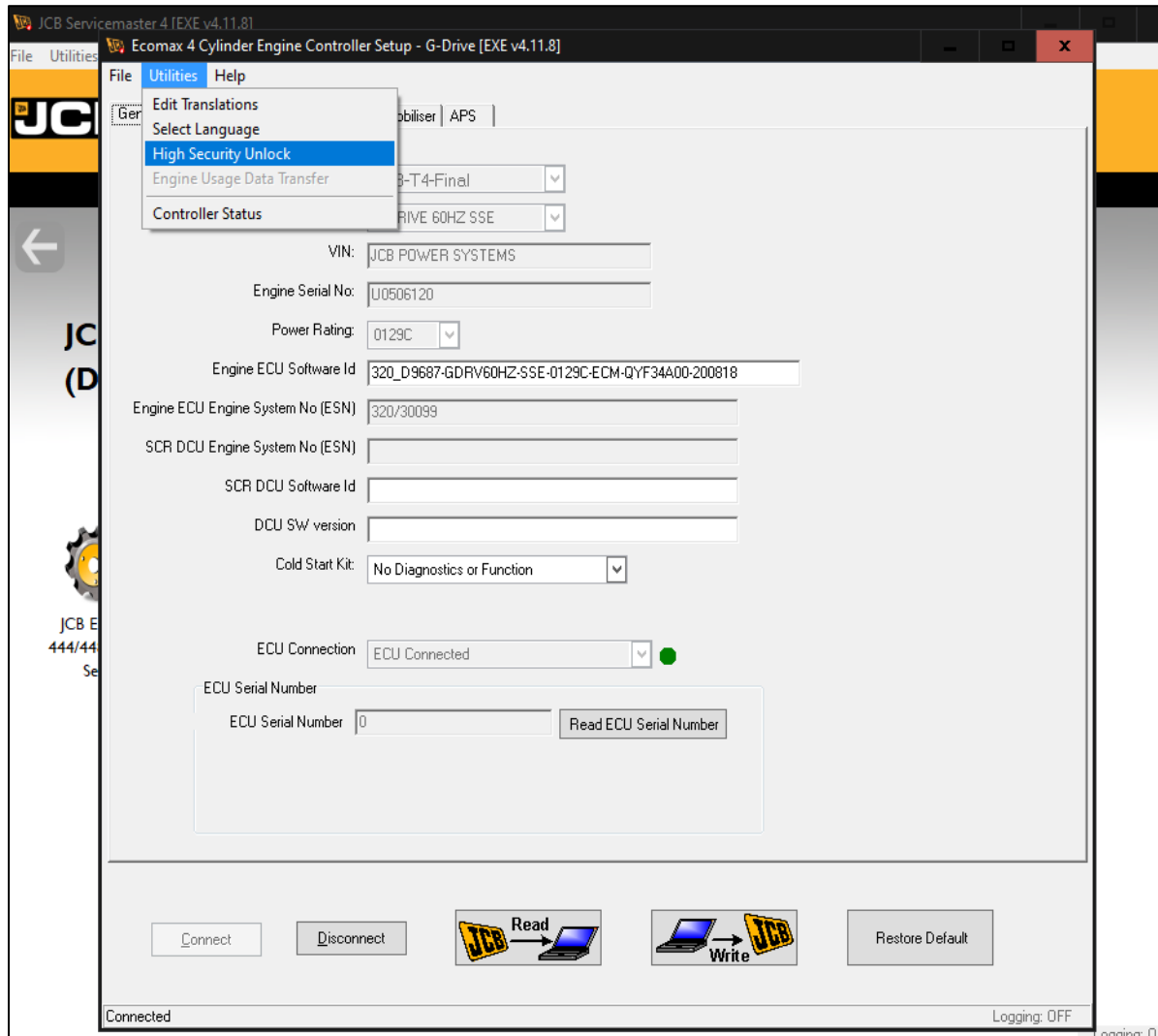


Figure 4

5. Copy the 'Challenge' section of code and create a Tech Web (TW) requesting an SCR Monitor unlock and include the following information:
  - a. Current SCR Monitor percentage.
  - b. Paste the 'Challenge' line of code separately into the TW without having it run into any other text you may have put into your TW. It needs to be clearly copied by the JCB representative answering the TW.
  - c. Ensure the Engine Serial Number is in the TW for the representative to use. It will start with a 'Uxxxxxx' and be located on the engine data plates and flywheel housing.

Stay connected to the machine and keep your Service Tool open while the TW is generating an answer. Do not close Service Master until the response is generated and returned to you. See figure 5 below.

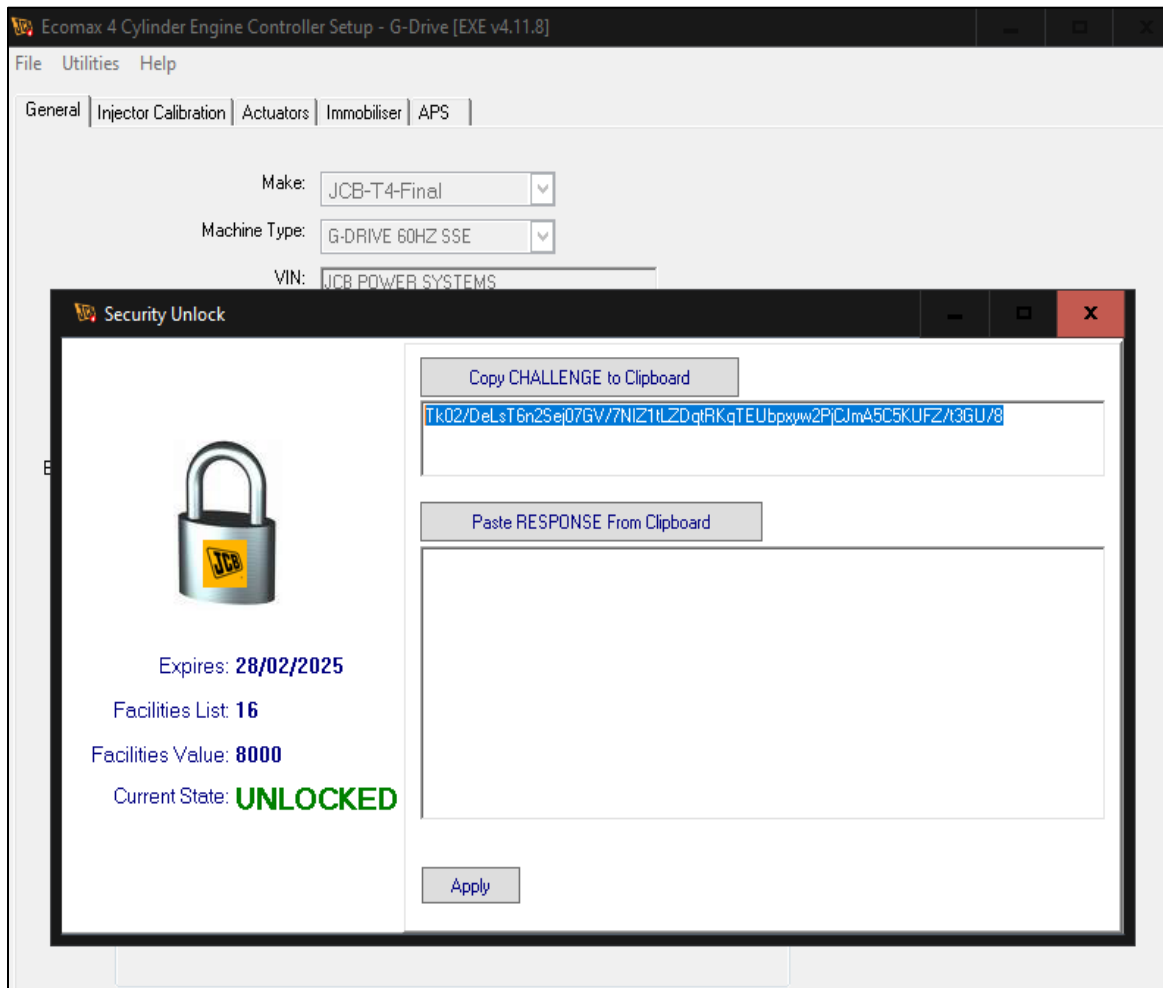


Figure 5

## Generating the SCR Monitor Unlock – JCB Representative Only

To fully disclose the process, the following steps will be done by the JCB factory representative with the appropriate access once the TW has been created and submitted to the factory requesting support.

- Ensure the representative has the JCB Code Meter dongle installed into an available port on their laptop.
- Open the Security Unlock Tool and from the 'Type' drop-down menu, select 'High Security'.
- Retrieve and copy the provided 'Challenge' line of text from the TW and paste it into the area shown as 'Section 1' and click the 'Decrypt and Validate' button #2.
- Select the 'Extended Expiry Date' from the drop-down menu #3. I recommend using the 12 month setting as the longest option to provide.
- Enter the 'Engine Serial Number' in the box shown as #4 making sure to use a capital 'U'.
- Click the 'Generate' button #5.
- Locate the generated block of text in box #6 and copy it and paste it into the TW without it being combined with any other text you may have entered. It needs to be clearly copied by the JCB dealer technician.

See figure 6 below.

The screenshot shows the Security Unlock Tool interface. The 'Type' dropdown is set to 'High Security'. A 'Paste CHALLENGE From Clipboard' button is at the top. A red box labeled '1' highlights the challenge text: 0001, 324B9E53627E0001, 64F4-D4F0, 29/02/2024. Below it is a 'Decrypt And Validate' button labeled '2'. The 'Product' dropdown is set to 'Power Systems'. The 'Extended Expiry Date' dropdown is set to '1 day' and is labeled '3'. There is a checked checkbox for 'SCR Monitor Reset'. The 'Facilities Response' has two input fields with values '8000' and '16'. The 'Engine Serial No' field contains 'U0506120' and is labeled '4'. A 'Generate' button is labeled '5'. A red box labeled '6' highlights the generated response text: rmc+zrst1VA9PJz1wbTeiAh9gZAP7Ao7+X3vK3e57vavjV4f6PQ+em4DPi2LzZt6h9VoP88kCxA0KCRANL+LK8Un9nKvzC4uaXmzMAK5MV67KkZp1D8pZg9Af1sLUrrCwMYE8UINXFTKDsxPeqGJZTCD8smJzu8vD MC8xhMqwnclLg5U2elcg3/tyzvPkhRLdnSP7Nwk5Dr2P0ftdApjTVSqxdyn2DoeHGivMouCaH9scuYkQrqEI EEJ9ndJE4WeAH7e2De0KmkGwBmo/rh9AM/hGG4fw9rFQqGhSgh5cNHISvdHerddGwUjpyt4M0EKcwH83 LfvAwk3/luZ2vBKQvQP3jMK7/N6M+EZZ2vyily0hgTHk/F2B9qYRdp8CA4PwKqSj9mTps/aPl +ZS9VYX9EDk5oQM5w2U0eJ2Tmx3McceG8vdduFAt2U5MJFP9fe// +H3NFPdviPgF60telBqz/W8xl0i5GjzkAgN6gpEa2mgqaogQD. Below the response is a 'Copy RESPONSE To Clipboard' button.

Figure 6

## Retrieving the SCR Monitor Unlock

- To reset the SCR monitor, copy and paste the response provided in the TW by the JCB factory representative into the 'Challenge Response' section of the open 'High Security Unlock' tool and click 'Apply'.

Note the following changes should occur if everything was done properly.

- *Facilities List* should show '16'
- *Current State* should show 'Unlocked'
- *Expires* should now have a date of 1 year out from current based on what the representative has selected.

Once applied, close out the EcoMax Engine Setup tool. See figure 7 below.

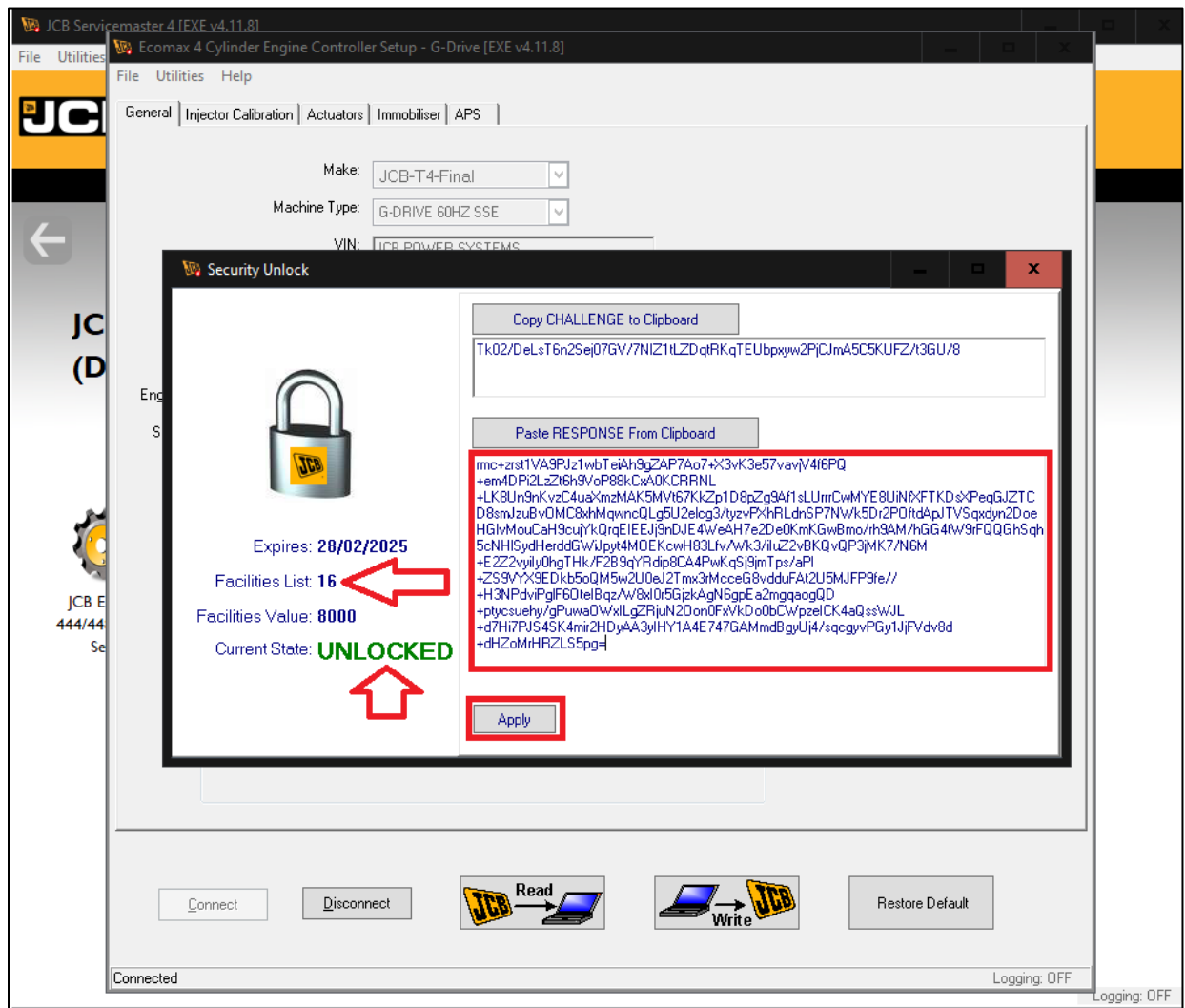


Figure 7

- Open the JCB EcoMax Engine Diagnostics tool once connected to the machine and having the machine 'Keyed On'. See figure 8.

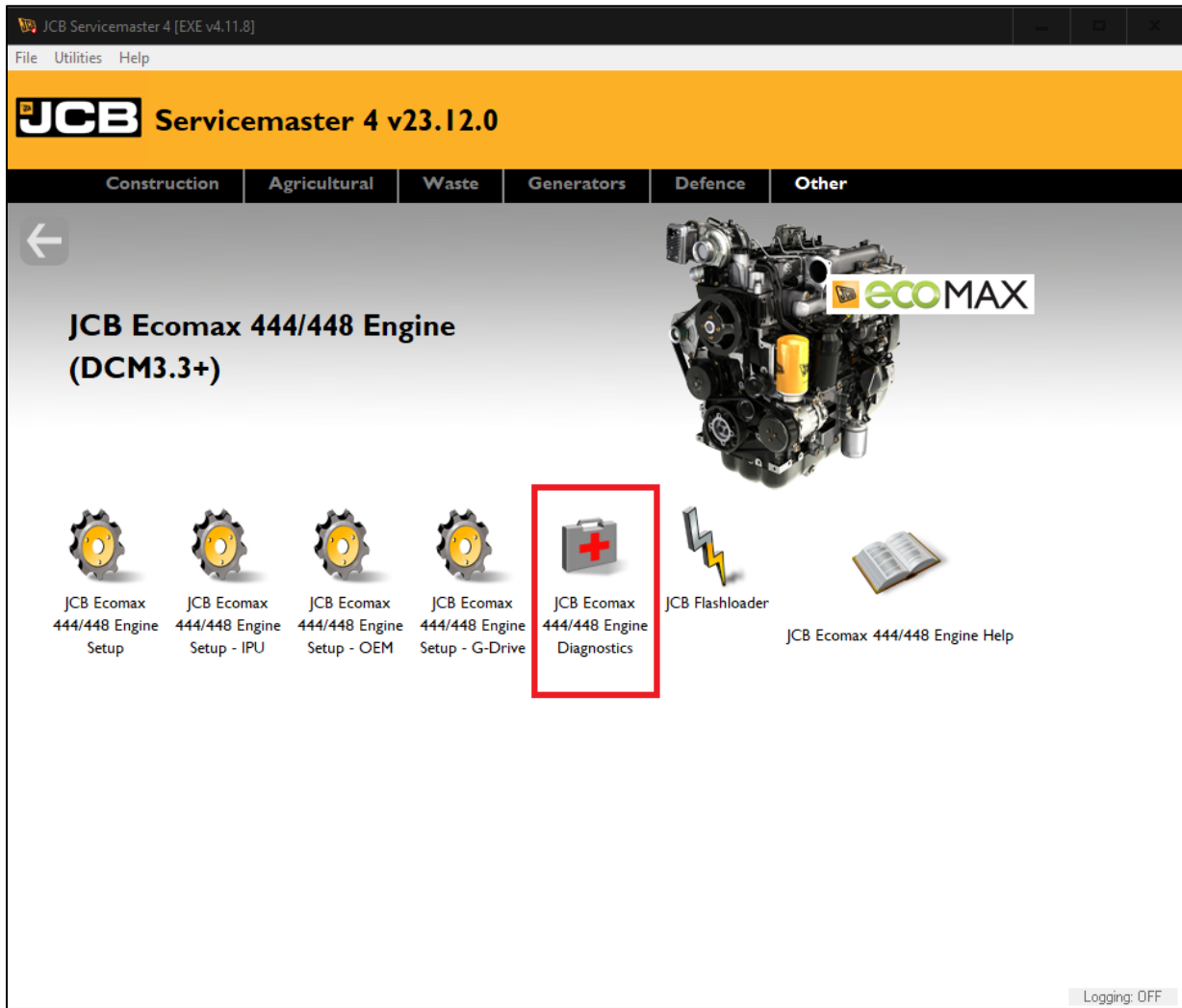


Figure 8

8. Once connected to the machine, navigate using the tabs across the top of the screens to 'Ecomax Actuators' and then on the second row of tabs, locate 'Actuator Resets'.

Note the 'SCR Monitor Reset' button is no longer greyed out as shown above in figure 2. Click on the 'SCR Monitor Reset' button and click 'Yes' on the pop-up as shown below in figure 9.

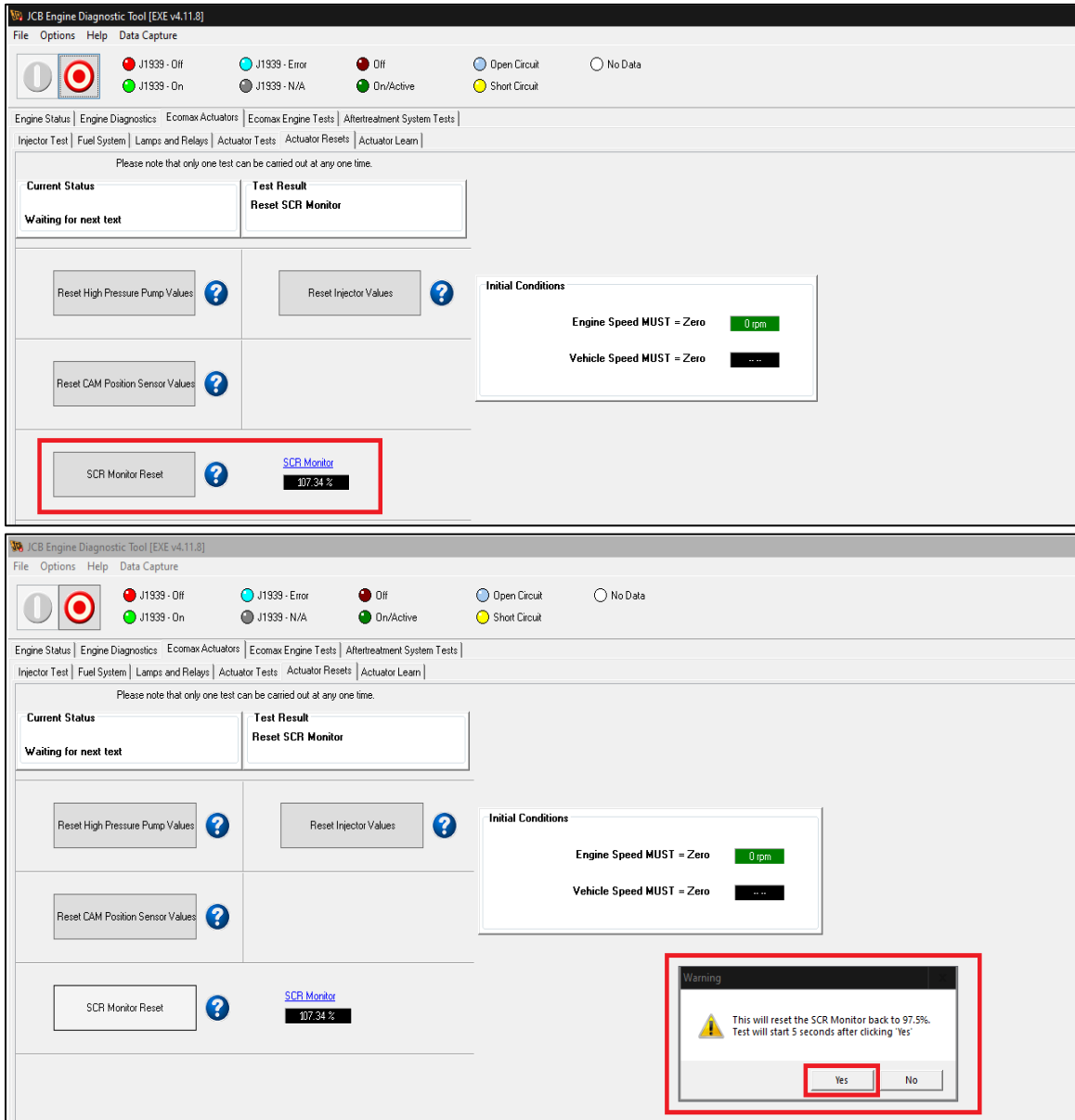


Figure 9

9. You should now see where the SCR Monitor value has changed and dropped to 97.x%. Click the 'Ok' button and 'Key Off' the machine until the K1 relay powers down and communication with ECM is no longer. See figure 10 below.

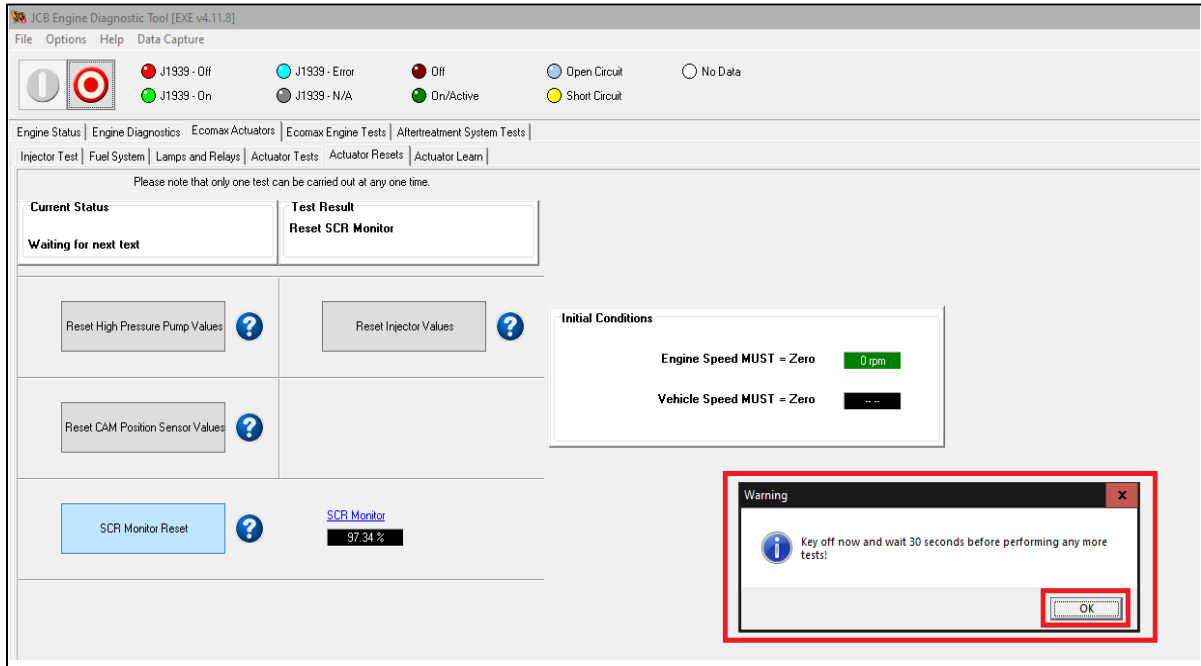


Figure 10

## SCR Refresh Process

Now that the SCR Monitor is reset to below 98% the machine needs to run a SCR refresh cycle. If the machine is anything outside of an JCB Industrial Power Unit (IPU) or G-Drive (Generator), you will simply need to run the machine up to a coolant temperature of 71 C (167 F) after ensuring the machine is not enabled to '*Automatic Refresh Inhibit*'. Please refer to the appropriate machine's Operators manual to review how to disable the '*Automatic Refresh Inhibit*' prior to beginning the process of refreshing the SCR.

If your engine has reached 71 C (167 F) and the machine's DEF level is greater than 50%, the machine should begin the SCR refresh cycle automatically and you will audibly hear a difference in the engine sound as the EGR position goes to 0% and the VGT turbo changes its position.

You should also notice some sort of indicator on the operator's panel that looks like the picture below. It is important that if this indicator is illuminated while the machine is in operation that the operator does not turn the machine off and allows the process to complete. Once the machine completes the SCR refresh process, the lamp will go out and at that time it is appropriate to turn the machine off if desired.



Depending on how lightly loaded the machine was or how high the SCR Monitor was prior to resetting it, the machine will likely begin smoking black smoke slowly turning grey and then clear as the cycle begins nearing the end. This is normal operation.

If observing the SCR Monitor during this process, once the SCR Inlet Temps reach roughly 480 C (900F) the process will start, and the SCR Monitor will slowly reduce until it reaches 0% at the end.

## Performing an SCR Refresh via Service Master

If the machine is a JCB Industrial Power Unit (IPU) or G-Drive (Generator), you may want to use Service Master (Version 8.2.23 or later) to run the SCR Refresh 'Garage Mode'. Once again, you will need ensure that you run the machine up to a coolant temperature of 71 C (167 F) and make sure DEF level is above 50%.

You will also need to ensure the machine is not enabled to 'Automatic Refresh Inhibit'. Please refer to the appropriate machine's Operators manual to review how to disable the 'Automatic Refresh Inhibit' prior to beginning the process of refreshing the SCR.

If the machine is a G-Drive (Generator) unit, you will need to add at least 30% electrical load such as a load bank of appropriate size to the machine to successfully start and complete a SCR refresh on this type of machine.

1. Open the JCB EcoMax Engine Diagnostics tool once connected to the machine and having the machine 'Keyed On'. Locate on the top row of tabs 'Aftertreatment Systems Tests' and click on it. Then click on the second-row tab labelled 'Aftertreatment Refresh'. Then press the button 'Press to Proceed'. See figure 11.

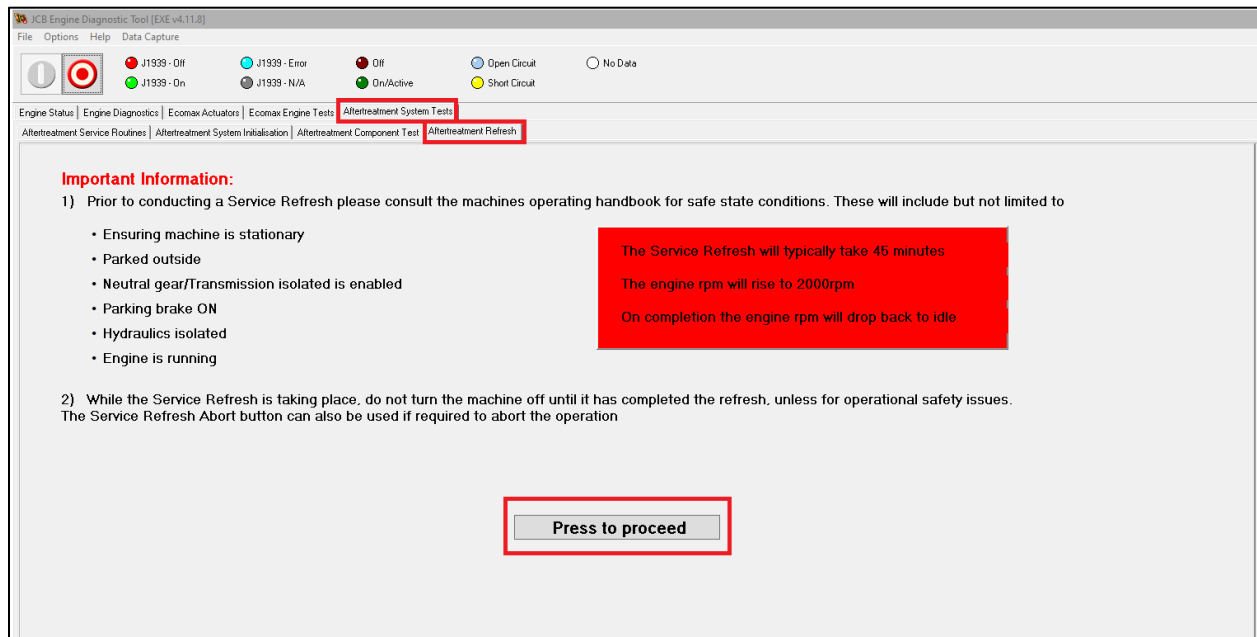


Figure 11

2. Check all three boxes ensuring the machine is in a safe location is a ready to perform the SCR refresh as shown in figure 12 below. Then once the 'Press to Proceed' button appears, click on it.

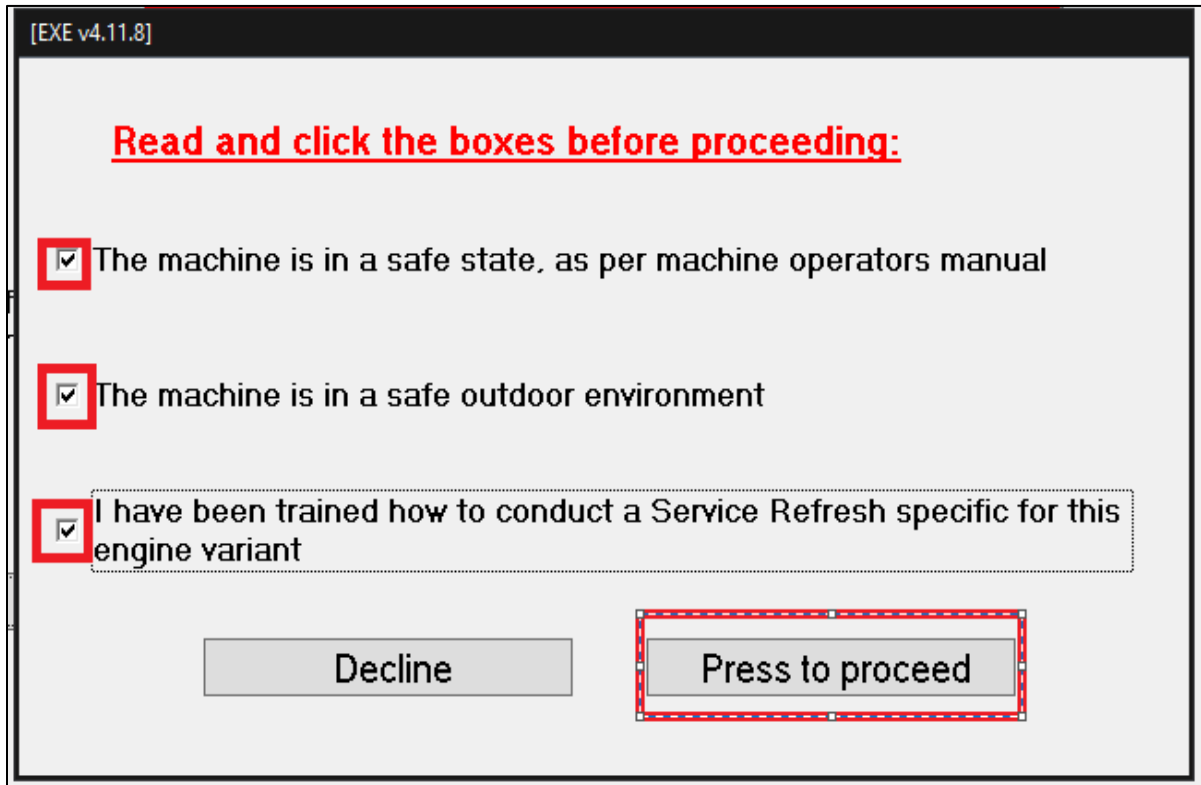


Figure 12

- Now start the machine and bring the coolant temperature up to 71 C (167 F). Note that engine speed readout box will not be green once your speed is above 700 RPM as the tool will go from RED to BLACK.

At this point, if not done already, please add the 30% or greater electrical load to the machine if a G-Drive (Generator) unit.

Now press the 'Stationary Refresh' button and the machine will begin its countdown. See Figure 12 below.

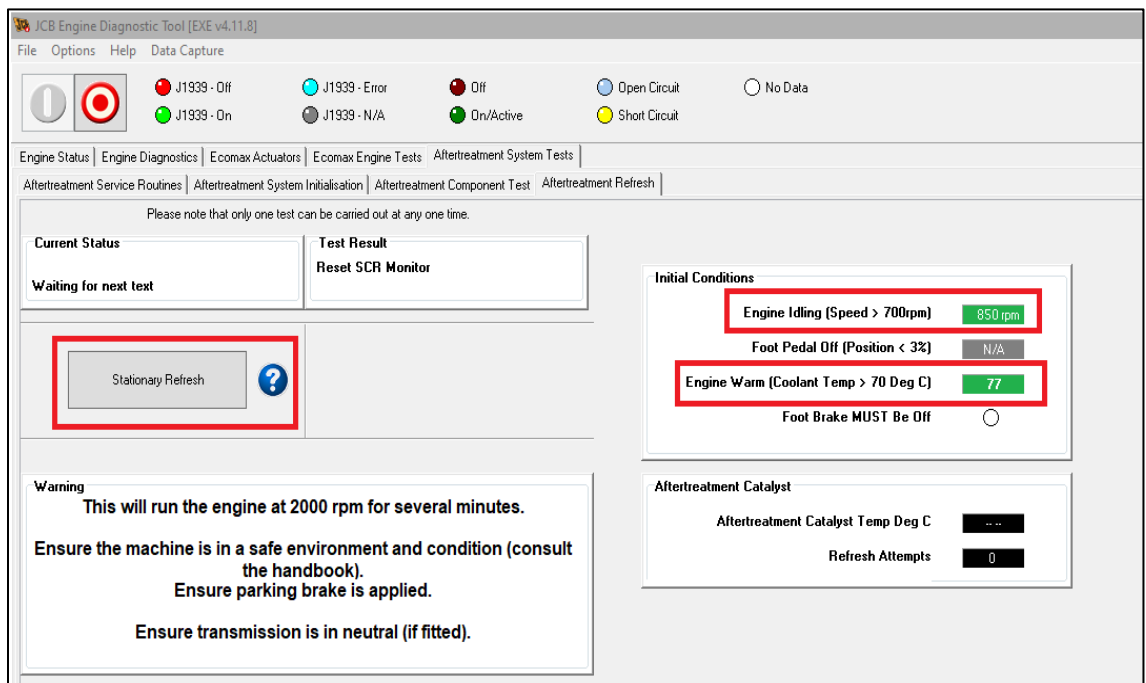


Figure 12

- The machine should begin to bring the SCR Monitor down to 0% after roughly 30-40mins. This can be monitored by looking at the SCR Monitor Reset value in Service Master or using the machine panel (if applicable) and looking for 'SCR / DPF Soot Counter / Load' within its Engine parameter values.

Once the machine reaches 0%, you can stop the test or let the system automatically stop the process after some time.

Note that if the machine does not complete a SCR Refresh successfully, the 'Refresh Attempts' counter will go up. This will only show the attempts performed using Service Master refresh mode and not any failed automatic refreshes the machine may have attempted on its own. See figure 13 below.

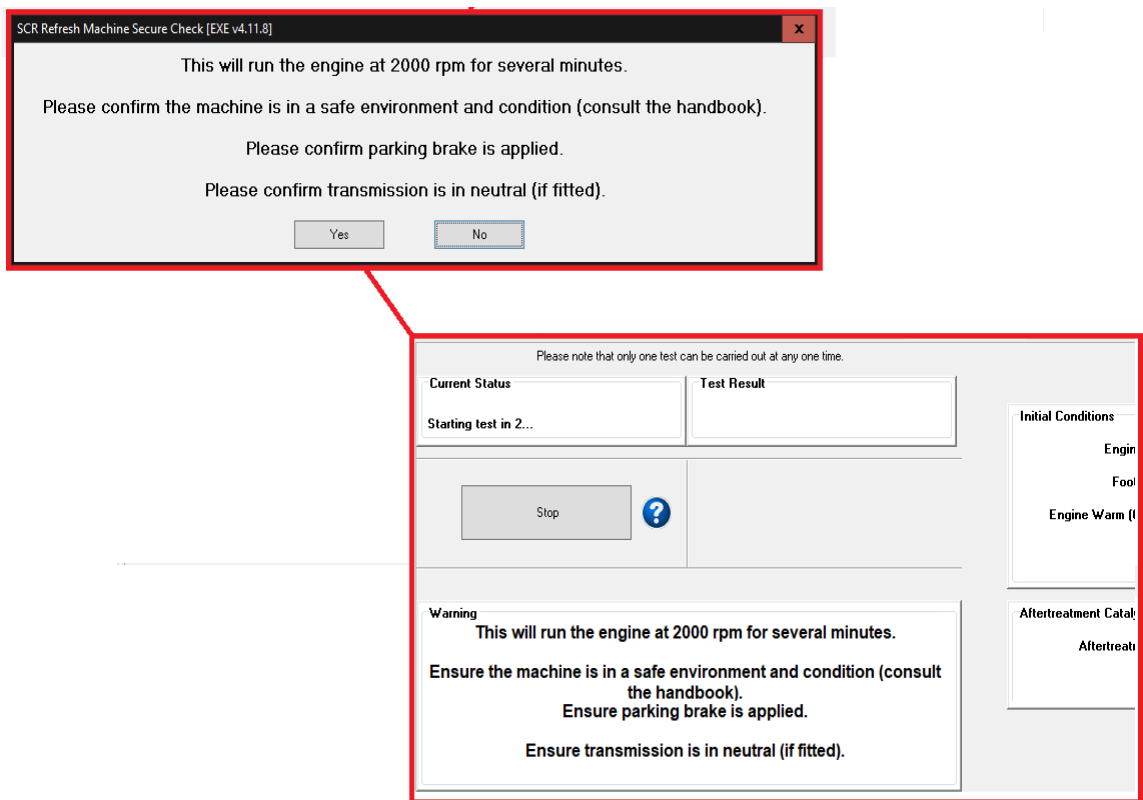


Figure 13