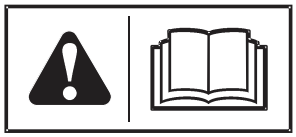

EFI Diagnostic Tool Software

en Operator's Manual

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Revision A

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Overview

The Briggs & Stratton® Diagnostic Tool lets you run performance diagnostics on all Briggs & Stratton electronic fuel injection engines.

Available diagnostics include:

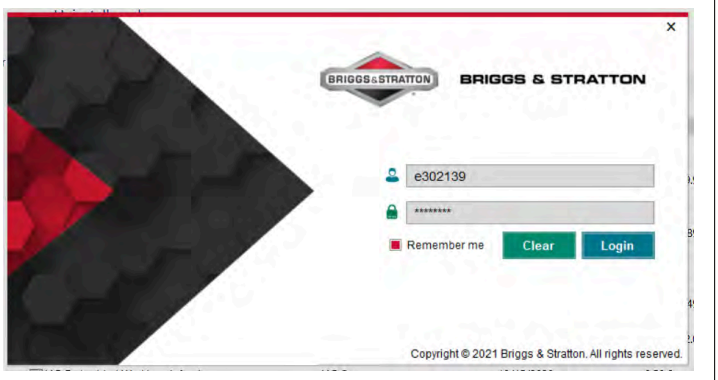
- Reading equipment statistics
- Reading and clearing fault codes
- Updating equipment control module calibrations
- Monitoring and charting equipment statistics on a graph

Log in to the Diagnostic Tool

You must log in to the Briggs & Stratton Diagnostic Tool using your Power Portal login credentials.

1. Open the software.
2. Enter your Power Portal username and password in the dialog (Figure 1).

1



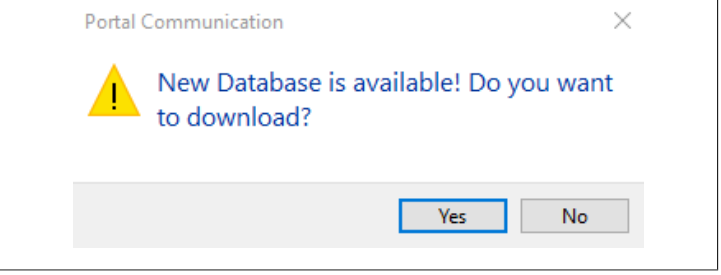
   If you do not have a Power Portal login, contact Briggs & Stratton to see if you qualify for one.
3. Click "Remember me" to save your username and password. If selected, the Diagnostic Tool will save your username and password when you load the software again.
4. Click "Login." The software will log you in and load the dashboard.
5. If you click "Clear" the software will clear the saved username and password.

Update the Diagnostic Tool Software

The software automatically checks for updates when it loads. You will be prompted to update if the software or database are out of date. The software also provides a method to manually check for updates.

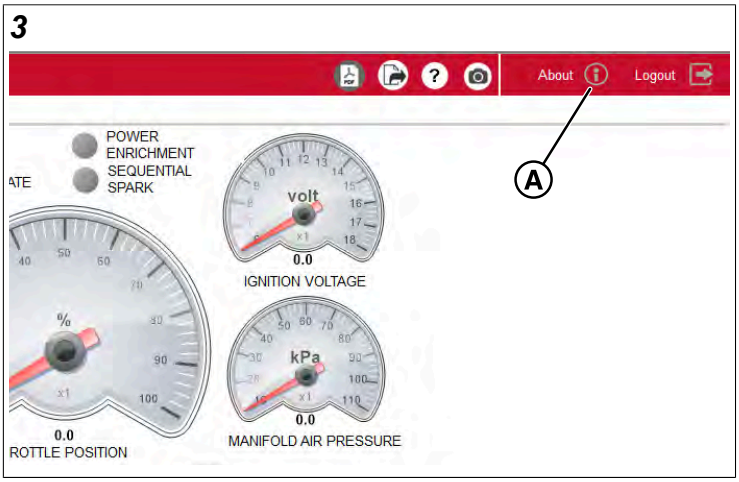
1. When opening the software a prompt will appear if there is new software or a new database available (Figure 2). Clicking "Yes" will automatically update your software. Clicking "no" will open your existing version of your software.

2



2. While software is open, click the "About" icon (A, Figure 3).

3

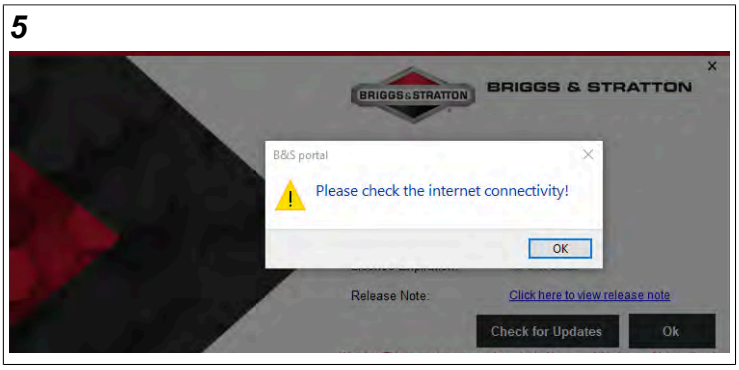


3. Click "Check for Updates" (A, Figure 4).

4

4. A popup will appear if there is a problem with the internet connection (Figure 5). Make sure that there is an Internet connection and try again.

5



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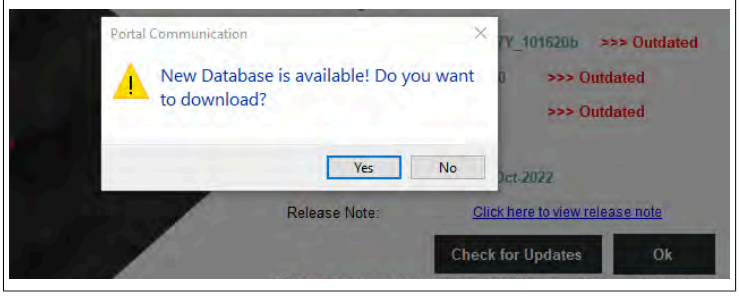
5. With an Internet connection, a pop-up window will appear (Figure 6) if there is a new database available. Click "Yes" and the new database will download (Figure 7). Click "Ok" when 100% is reached (A).

6



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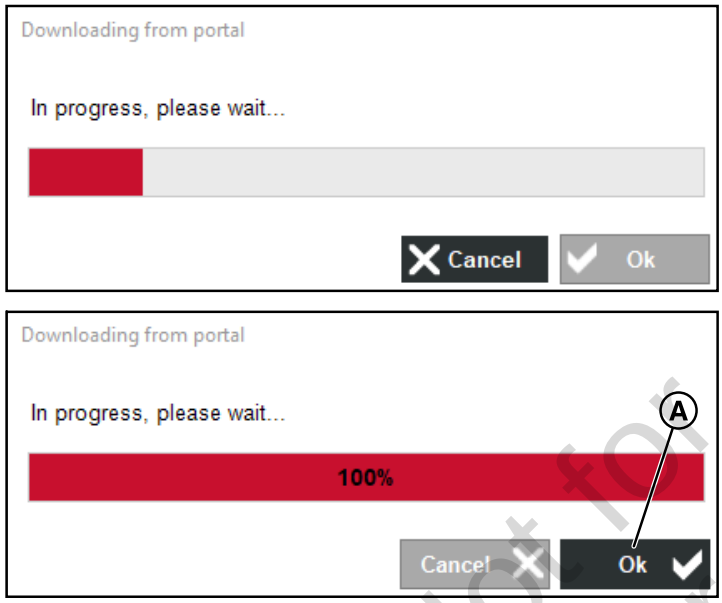
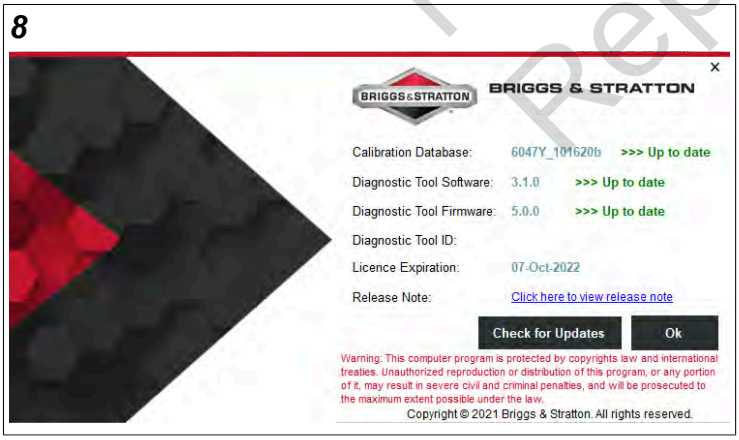


6. Your software will reflect that the new database in installed and current (Figure 8).

8



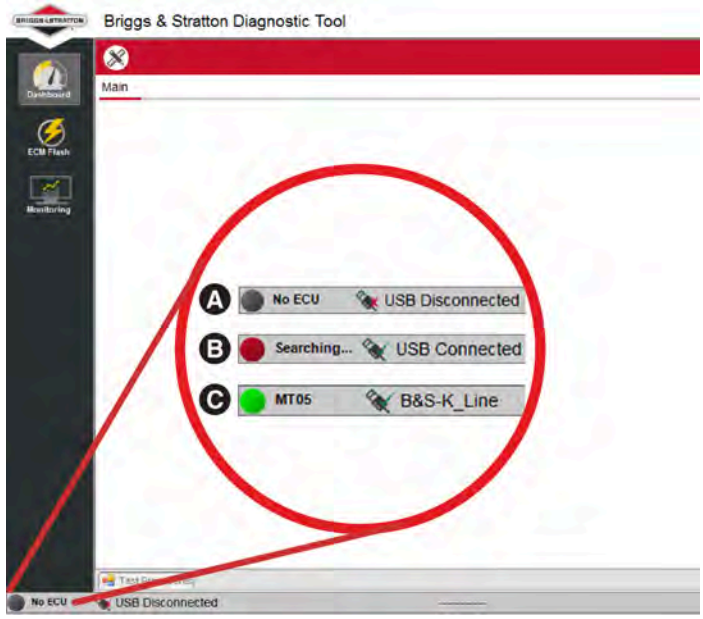
7. Click "Remember me" to save your username and password. If selected, the Diagnostic Tool will save your username and password when you load the software again.
8. Click "Login." ***NOTICE:*** The software will log you in and load the dashboard.

Connect to a Product

Before diagnostics, you must connect the EFI cable to the computer and the product.

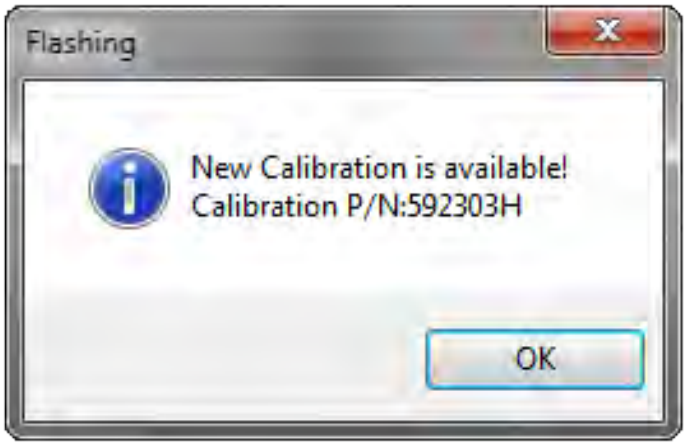
1. Open the Diagnostic Tool Software.
2. Use your Briggs & Stratton Power Portal credentials to login to the software. The software will show that it is not connected to the cable (A, Figure 9).

9



3. Connect the Diagnostic Tool USB cable to an available USB port. Make sure that the Diagnostic Tool shows "USB Connected" (B, Figure 9).
4. Connect the Diagnostic Tool to the diagnostic port.
5. Turn the ignition ON. DO NOT start the unit. The Diagnostic Tool can take up to 30 seconds to connect. Make sure that the Diagnostic Tool shows the green status (C, Figure 9). The Diagnostic Tool can perform diagnostics only when the connection status is green and when the USB status is connected (C).
6. When you connect to a product, the Diagnostic Tool automatically checks for updates. If an update is available, you will receive a New Calibration prompt as shown (Figure 10). It is recommended that you update the calibration if prompted (see *"Update the Calibration"*).

10



7. Start diagnostics.

Statistics

One of the primary functions of the Diagnostic Tool is to read statistics.

The Diagnostic Tool lets you read many different statistics for use in troubleshooting and diagnostics. Statistics are available in the Dashboard, Troubleshooting Dashboard, and Monitoring.

Read Statistics

1. Connect to a product (see *"Connect to a Product"*). .

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2. Click "Dashboard" (Figure 11).

11

3. Use the Dealer or Troubleshooting dashboard.

Fault Code Diagnostics

The product has active diagnostic fault codes when the malfunction indicator lamp illuminates.

For assistance with troubleshooting procedures that relate to diagnostic trouble codes, see the *"Electronic Fuel Injection Service & Diagnostics Manual."* The manual is available for download at The Power Portal (www.thepowerportal.com/EFI). Use the correct diagnostic and repair manual for your EFI system.
When a diagnostic fault code is present, the diagnostic tool gives you the ability to:

- Read the numeric diagnostic code
- Get details related to the diagnostic code
- Access troubleshooting flowcharts for the diagnostic code
- Clear the diagnostic code

There are two types of diagnostic fault codes:

- Current: shows that the fault is currently present.
- History: shows that the fault was present at some point after the fault codes were cleared.

Read Diagnostic Fault Codes

The diagnostic fault codes can be read from the main or the troubleshooting dashboard.

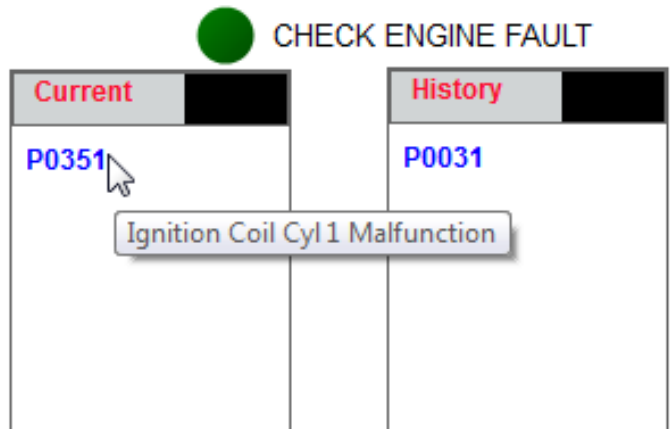
1. Connect to the product (see *"Connect to a Product"*).
2. Click "Dashboard" (Figure 12).

12

3. Click Dealer or Troubleshooting. Both dashboards let you read diagnostic fault codes.

4. The "Check Engine Fault" status will be green if a current fault code is present. The Diagnostic Tool will display the fault code text when you hover over the numeric code (Figure 13).

13

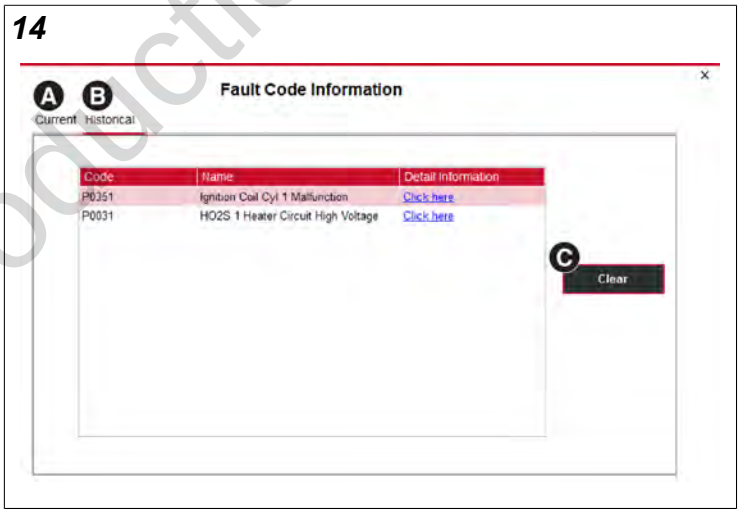


Diagnostic Fault Code Details

The Diagnostic Tool Software shows flowcharts for each diagnostic fault code to assist with troubleshooting.

1. Read the diagnostic fault code (see *"Read Diagnostic Fault Codes"*).
2. Click the diagnostic code in the current or historical code list.
3. The Diagnostic Tool lets you view fault code information for all current and historical diagnostic codes (Figure 14).

14



4. When you click "Current" (A), the current fault codes will come into view.
5. When you click "Historical" (B), the historical fault codes will come into view.
6. Click "Click here" to open detail information for the fault code.

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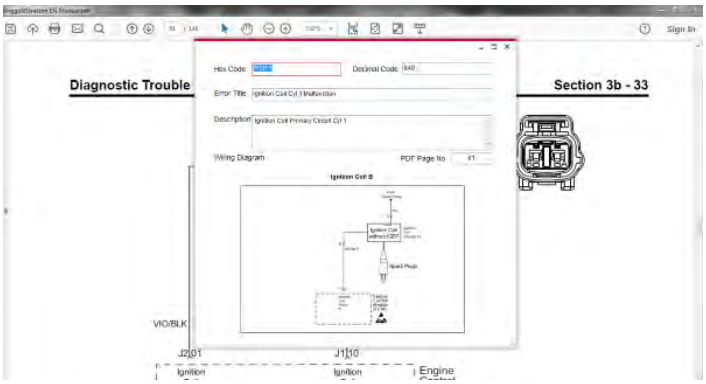
7. The fault code details will load with the EFI Service Manual's troubleshooting flowchart behind it (Figure 15). After you review the details, close the dialog, and use the flowchart to perform the troubleshooting steps.

15



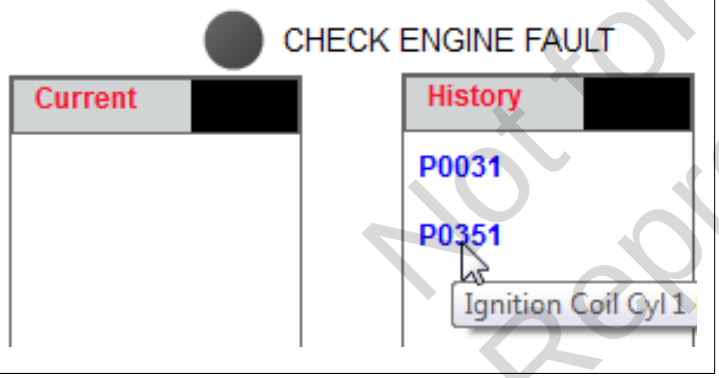
8. When you complete the troubleshooting steps, close the flowchart. You will return to the Diagnostic Tool software.
9. Clear the diagnostic fault code to confirm you have corrected the fault (see *"Clear Diagnostic Fault Codes"*).

Clear Diagnostic Fault Codes

The diagnostic fault code will be automatically removed from the current list when the fault has been corrected. The diagnostic fault code will show in the historical list until it is manually cleared. The diagnostic fault code can be cleared after the fault has been corrected.

1. Click on the fault code in the historical list on the dashboard (Figure 16).

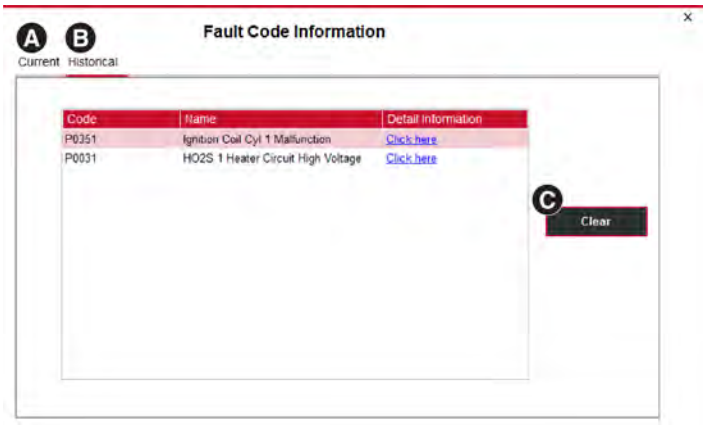
16



NOTICE: Clearing fault codes will clear all fault codes.

2. The list of historical fault codes will come into view (B, Figure 17).

17



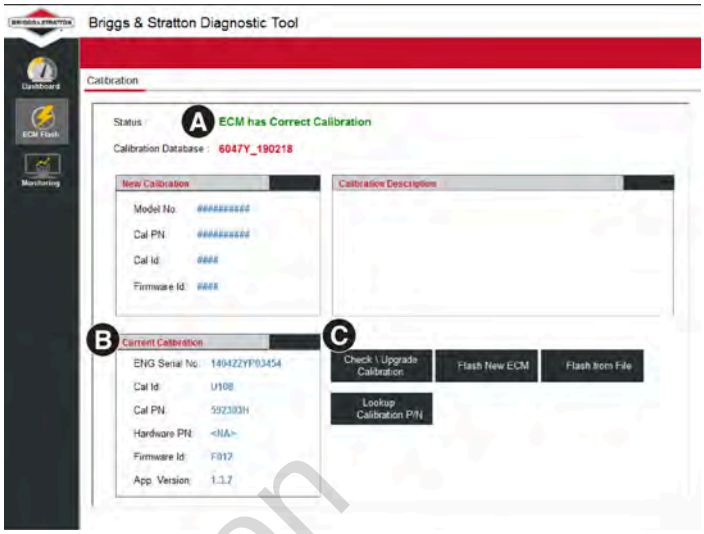
3. Click "Clear" in the fault code list (C).
4. The codes are cleared. If a code shows in the current fault code list, the fault still exists. You should perform additional diagnostics.

Flash the ECM

An ECM Flash shows details about the current calibration on the ECM, updates ECM calibrations when available, and lets you program a new ECM.

The ECM Flash screen shows the calibration status (A, Figure 18), calibration information (B), and buttons for ECM programming (C).

18



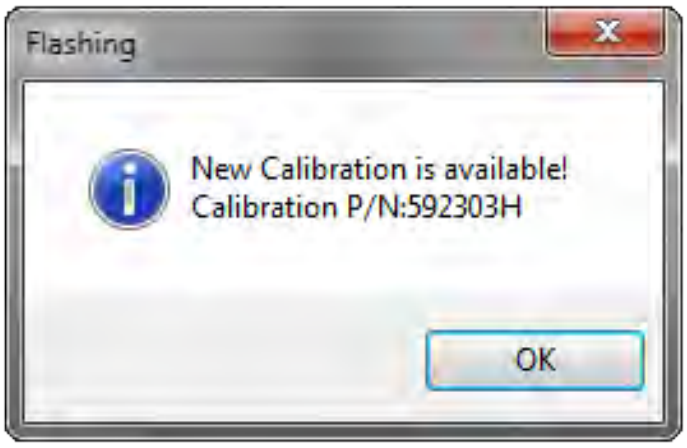
Update the Calibration

The Diagnostic Tool automatically checks for calibration updates when you connect to a product. If updates are available, you will receive a Calibration Update prompt.

NOTICE: The Diagnostic Tool downloads calibration updates from the internet every time you open the software. You can use the software without an Internet connection, but be aware that you cannot receive calibration updates without an Internet connection. If you plan to perform equipment diagnostics without an Internet connection, it is recommended that you first open the software with an Internet connection in order to update the calibration database. The equipment does not need to be connected in order to download these updates.

1. Connect to a product (see *"Connect to a Product"*).
2. When you connect to the equipment, the Diagnostic Tool automatically checks for updates to the equipment calibration. You will receive a prompt after the connection, if an update is available (Figure 19). Continue to the next step to perform a calibration update.

19



3. Click "ECM Flash" (A, Figure 20).

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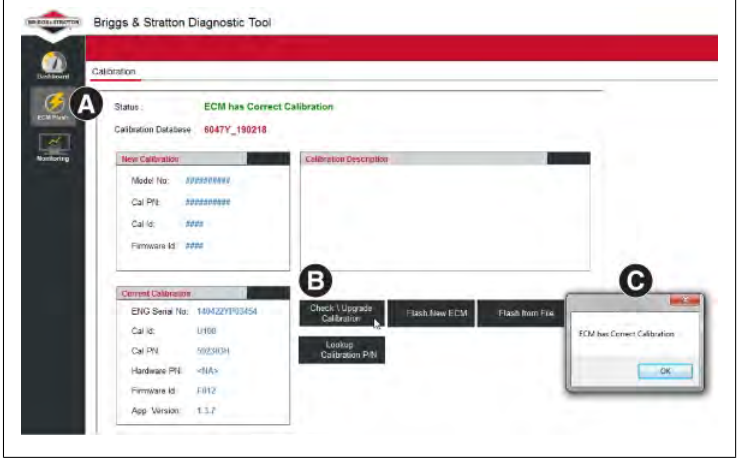
4. Click "Check / Upgrade Calibration" (B, Figure 20).

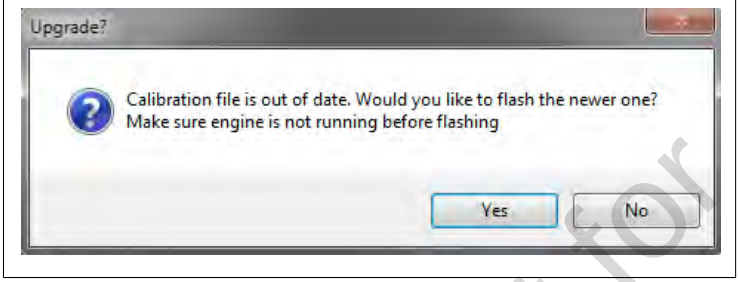
20



If the calibration is current, the Diagnostic Tool will prompt to confirm (C, Figure 20). No further action is required.

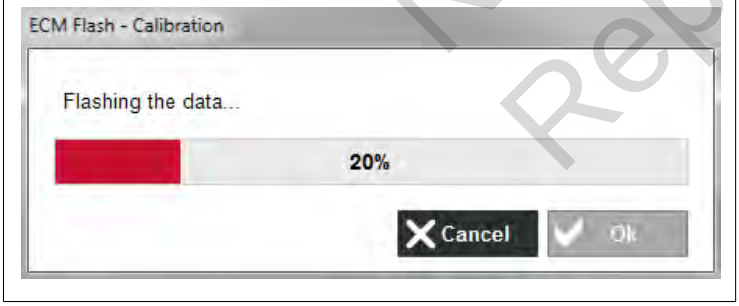
If the calibration is out of date, you will receive an Upgrade prompt to update the calibration (Figure 21). Continue to next step.

21



5. Click "Yes" to start the calibration update. The Diagnostic Tool will start flashing the ECM (Figure 22).

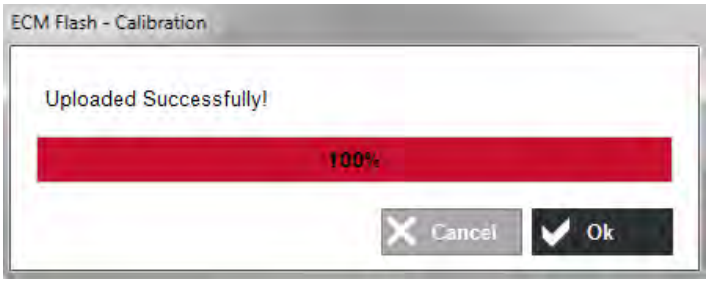
22



NOTICE: It will take 1-2 minutes to install the new calibration.

6. Turn off the equipment ignition when complete. Click "Ok" (Figure 23).

23



7. Wait 5 seconds.
8. Turn ON the equipment ignition.
9. The Diagnostic Tool will connect again.

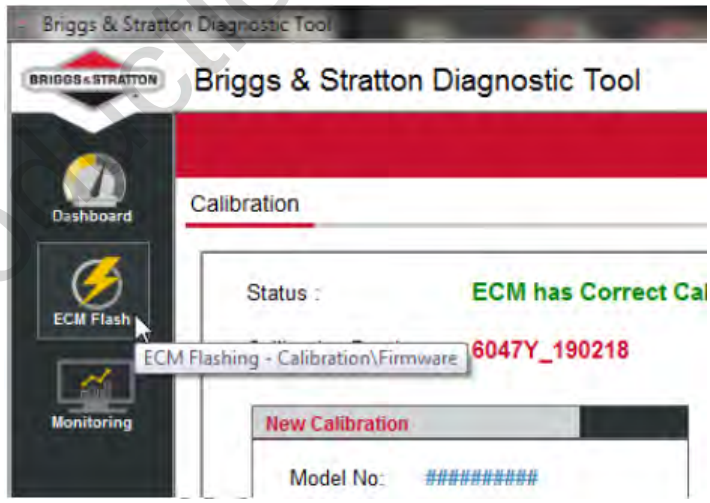
Manually Check for Calibration Updates

To make sure that the ECM has the most up to date calibration, check for calibration updates. Briggs & Stratton recommends that you always update the calibration when servicing the equipment.

NOTICE: The Diagnostic Tool will automatically check for calibration updates when it connects to a product. It will prompt you to update if needed. Follow these steps to manually check the calibration.

1. Connect to the product (see *"Connect to a Product"*).
2. Click ECM Flash (Figure 24).

24



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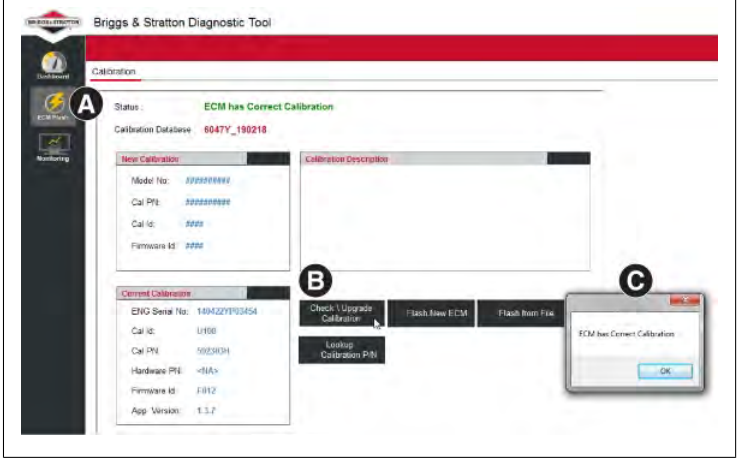
3. Click "Check / Upgrade Calibration" (B, Figure 25).

25



If the calibration is current, the Diagnostic Tool will show a prompt to confirm (C). No further action is required.

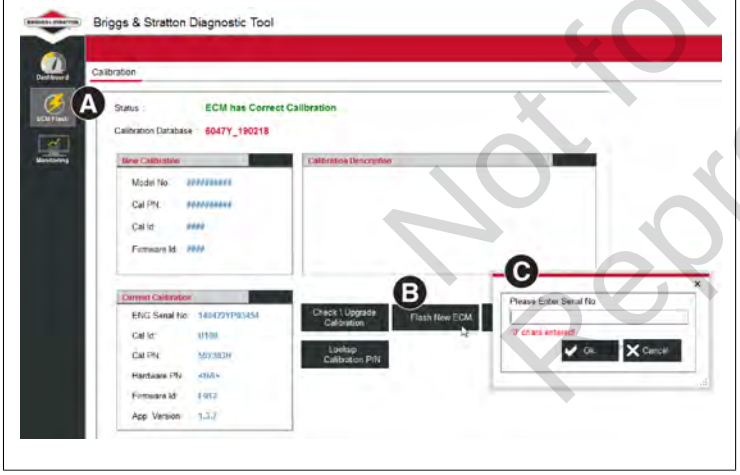
If the calibration is out of date, The Diagnostic Tool will show a prompt to update the calibration (see *"Update the Calibration"*).

Program New ECM

If the ECM requires replacement on an engine, the new ECM will be blank and the equipment will not run. This process will show you how to program a new ECM.

1. Connect to the product (see *"Connect to a Product"*).
2. Click "ECM Flash" (A, Figure 26).
3. Click "Flash New ECM" (B).

26



4. When prompted, enter the equipment's serial number (C). Click "Ok."

NOTICE: You must use the correct serial number for this equipment, or damage to the equipment will occur.

5. The Diagnostic Tool will now program the ECM with the correct calibration.
6. Turn off the equipment ignition when complete.
7. Wait 5 seconds.
8. Turn the ignition back on. The Diagnostic tool will connect again.

Monitoring and Charting

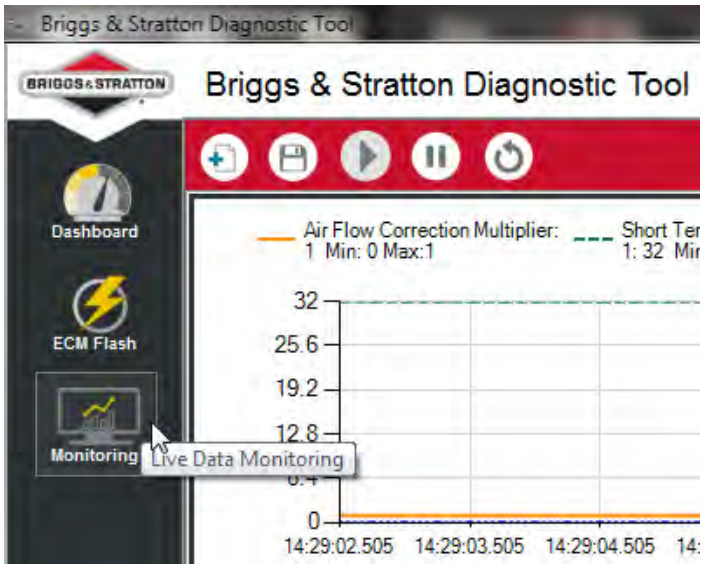
Monitoring gives you a live graph of equipment data. Charting gives you a viewing of a saved monitoring log file. In Monitoring, you can view live graphs, save your graphs, and load saved graphs. Graphs are a valuable resource when diagnosing complex equipment problems.

View Live Equipment Data

You can view live engine data in Monitoring. This screen shows eight synchronized graphs. You can configure each graph with one or more equipment parameters.

1. Connect to the product (see *"Connect to a Product"*).
2. Click "Monitoring" (Figure 27).

27



The Diagnostic Tool Software will remember the parameter selections for each graph when you exit.

The live graphs will come into view.

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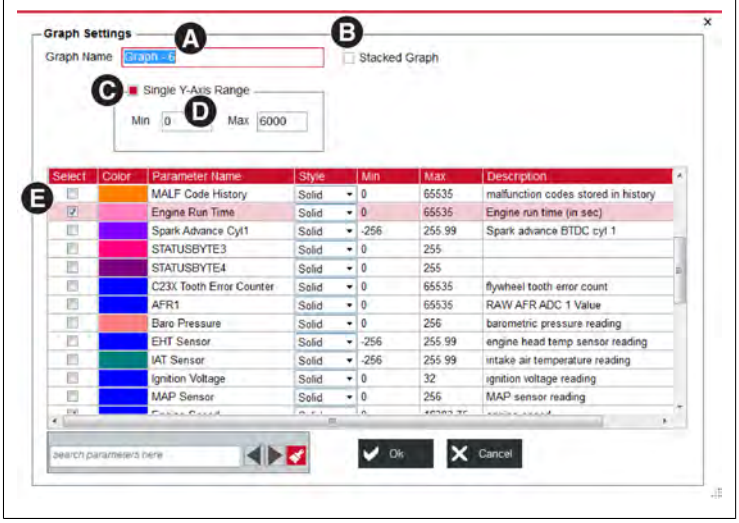
3. To change a parameter in a graph right-click on the graph to change your parameter selection. The graph settings dialog will appear (Figure 28).

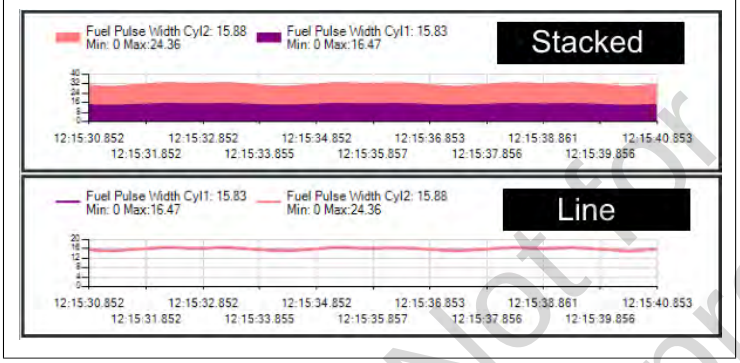
28



a. Name the graph (A). This step is optional.

b. Click "Stacked Graph" (B) to turn stacked graph display (Figure 29) ON or OFF for this graph.

29



c. Click "Single Y-Axis Range" (C, Figure 28) to turn single axis ON or OFF for this graph. Single Y-axis "checked" will show a single axis range for all parameters. Single Y-axis "unchecked" will show Y-axis for every selected parameter. Uncheck Single Y-axis when the selected when the selected parameter are widely varied.

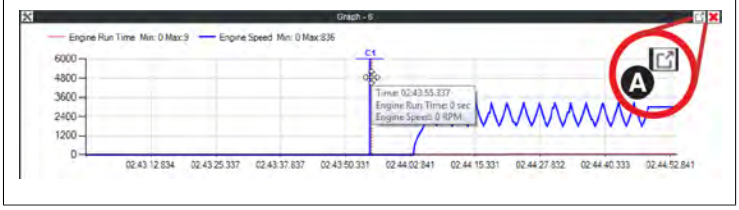
d. Enter axis range (D) to reflect expected smallest and largest values.

e. Click the checkbox in the "Select" column (E) for each parameter to show in this graph.

4. To maximize one graph for better viewing:

a. Click on the graph you want to maximize. The graph header will come into view (Figure 30).

30

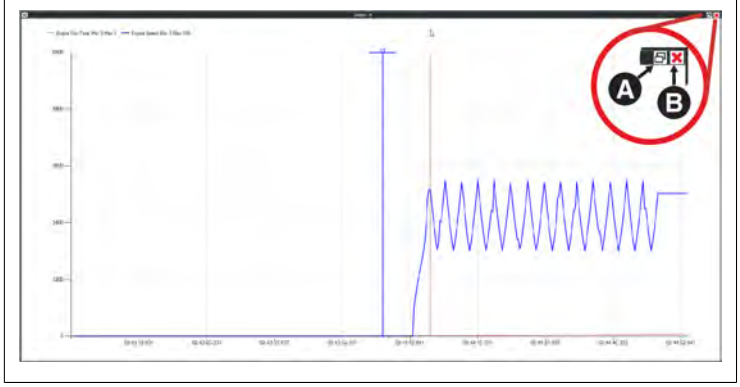


b. Click the "Maximize/Restore" button (A).

5. To minimize a graph and view all graphs again:

a. Single click the graph. The graph header will come into view (Figure 31).

31



b. Click the "Maximize/Restore" button (A).

6. To close a graph:

a. Click the graph. The graph header will come into view (Figure 30).

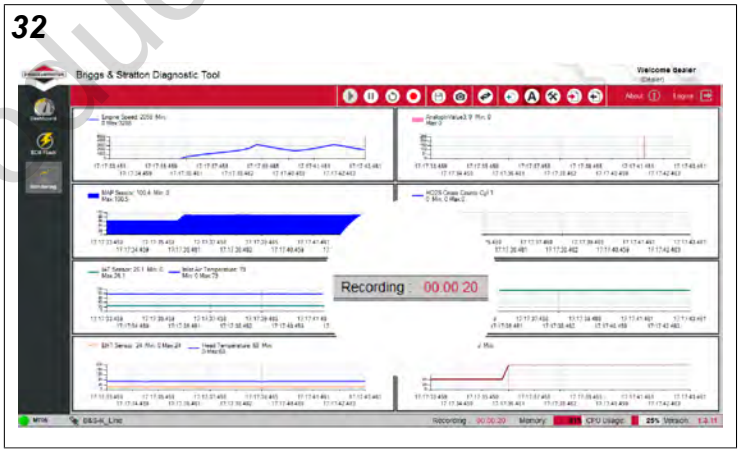
b. Click the "Close" button (B).

Record and Save Equipment Data

The Diagnostic Tool can record live equipment data and save it to a file to view later. By default, the Diagnostic tool will record all equipment parameters to the log file. This can be changed in "Log Settings" but it is recommended to always log all equipment parameters. The Diagnostic Tool automatically starts recording equipment data when it connects.

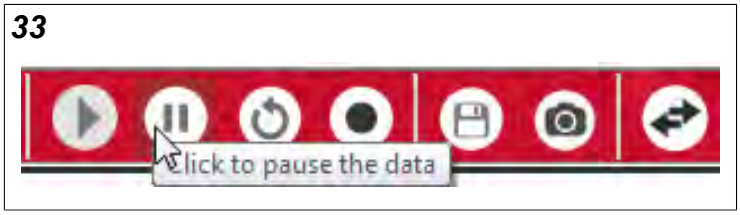
1. To record live equipment data, connect to the product (see *"Connect to a Product"*).
2. The Diagnostic Tool automatically records live equipment data. You can confirm the recording status and duration in the bottom status bar of the Diagnostic Tool (Figure 32).

32



3. Click "Pause" to pause the live graph (Figure 33). It does not pause the recording.

33



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4. Click "Play" to start showing the live graph again (Figure 34).

34

5. Click "Reset Graph" to reset the graph. The graph will clear and show the graph data again. The recording data will also reset (Figure 35).

35

6. The Diagnostic Tool records when the "Record" button is red (Figure 36). The Diagnostic Tool will automatically record when it connects to a product. Click "Record" to stop recording. This will delete all recorded data and stop recording without saving.

36

7. The Diagnostic Tool is not recording when the Record button is "black" (Figure 37). Click the "Record" button to start recording again. The recording status on the button status bar will show "Recording" and will start counting the recording time.

37

8. Click the "Save" button to save the current live engine recording (Figure 38). The Diagnostic Tool will prompt you to select a File Path (Figure 39). Click the folder (A) and select the location where you would like to save the recording. Then enter a File Name (B). You can also enter comments, user, and company as optional information. Click "Save" (C).

38

39

9. Click "Log Settings" to modify the parameters that will be recorded (Figure 40).

40

10. The Diagnostic Tool lets you export and import graph settings so that you can save graph configurations for different troubleshooting processes. Click "Import Graph Settings" to import a saved graph settings file (Figure 41).

41

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11. Click "Export Graph Settings" to save the current graph configuration for future use (Figure 42).

42

12. Click "Switch to Charting"(Figure 43) to switch to open saved engine log files. This will activate the Charting toolbar (see *"Load a Saved Engine Chart"*).

43

Load a Saved Equipment Chart

Live engine monitoring data can be saved for future review or to send to another user. All equipment parameters are recorded when saving a live equipment graph.

1. Click "Monitoring."
   You do not need to have The Diagnostic Tool Cable does not need to be connected to use this feature.
2. Click "Switch to Charting" (Figure 44).

44

NOTICE: The toolbar will change to the charting toolbar.

3. Click the folder to open a saved graph (Figure 45).

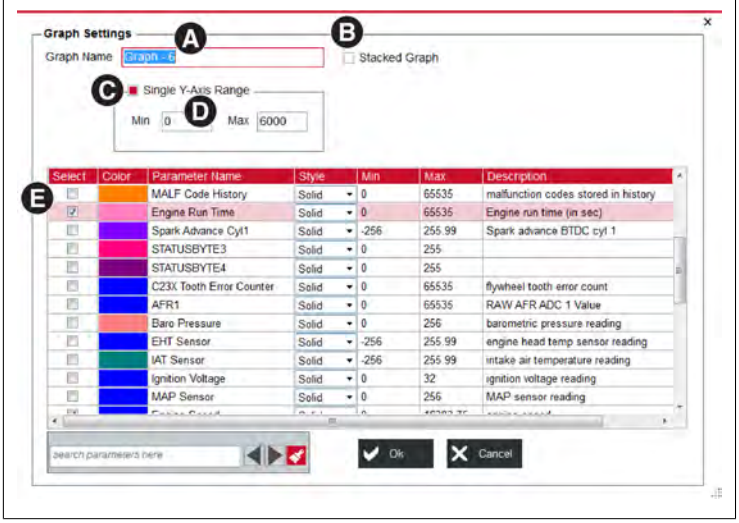
45

4. Select the saved recording from your hard drive. ***NOTICE:*** The saved graph will load.

5. To change a parameter in a graph:

   a. Right-click on the graph to change your parameter selection. The graph setting dialog will appear (Figure 46).

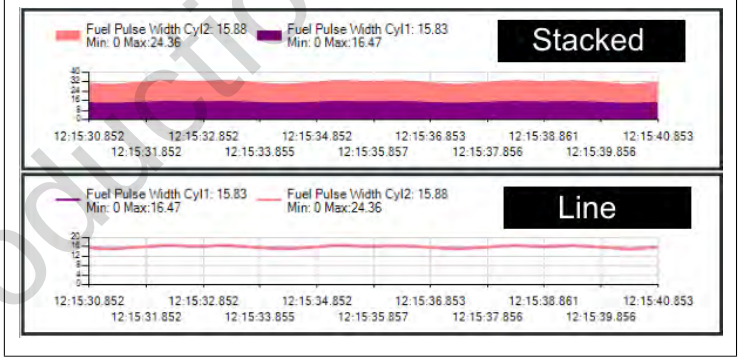
46



   b. Name the graph (A). This step is optional.

   c. Click "Stacked Graph" (B) to turn stacked graph display (Figure 47) ON or OFF for this graph.

47



   d. Click "Single Y-Axis Range" (C, Figure 46) to turn single axis ON or OFF for this graph. Single Y-axis "checked" will show a single axis range for all parameters. Single Y-axis "unchecked" will show Y-axis for every selected parameter. Uncheck Single Y-axis when the selected when the selected parameter are widely varied.

   e. Enter axis range (D) to reflect expected smallest and largest values.

   f. Click the checkbox in the "Select" column (E) for each parameter to show in this graph.

6. To zoom in on a graph timeline:

   a. Click the "Zoom in" button on the toolbar (Figure 48).

48

   b. Then hover the area of one of the graphs you would like to zoom in. You will see a zoom in mouse icon.

   c. Click to zoom in. Continue to click to zoom in again.
   NOTICE: All graphs will zoom when you zoom on one graph.

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7. To zoom out of a graph:

   a. Click the "Zoom out" button on the toolbar (Figure 49).

49

   b. Hover the area of one of the graphs you would like to zoom out. You will see a zoom out mouse icon.

   c. Click to zoom out. Continue to click to zoom out again.
   NOTICE: All graphs will zoom out when you zoom out on one graph.

8. A cursor will mark a location on the graph timeline which can be used to view all engine parameters at that timeline. To add a cursor to all graphs:

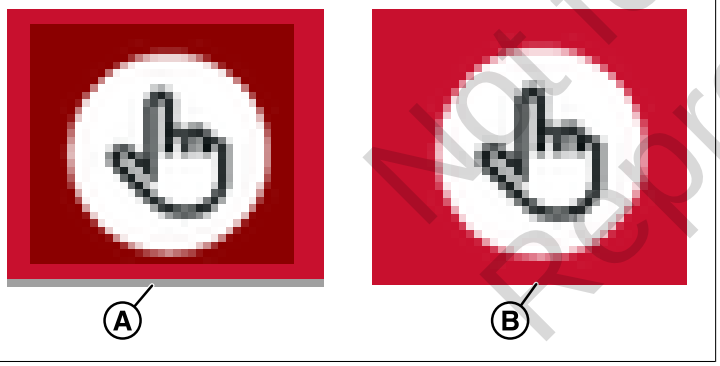
   a. The Diagnostic Tool lets you click on a point in the graph to add a cursor. When you click at a different time on the graph, it will move the previous cursor.

   b. You can click the "Cursor" button to let you place multiple cursors (Figure 50).

50

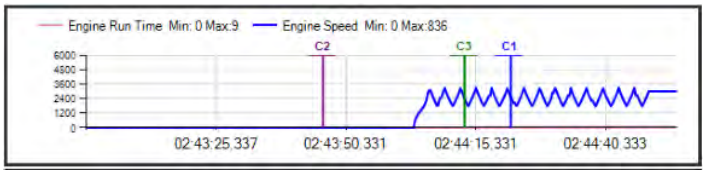
NOTICE: When multiple cursors are ON, the "Cursor" button is gray (A, Figure 51). You can create many cursors on the graph. When multiple cursors are off, the button is not gray (B). You can only create one cursor.

51



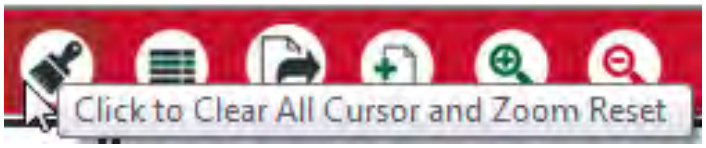
   c. Click on the graph (Figure 52) that you would like to create a cursor point.
   NOTICE: The Diagnostic Tool automatically adds a cursor to every graph at the same location.

52



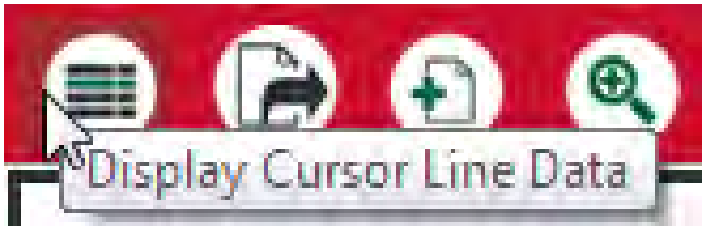
9. To clear cursor and zoom selections, click the "Clear Cursor and Zoom" button (Figure 53).

53

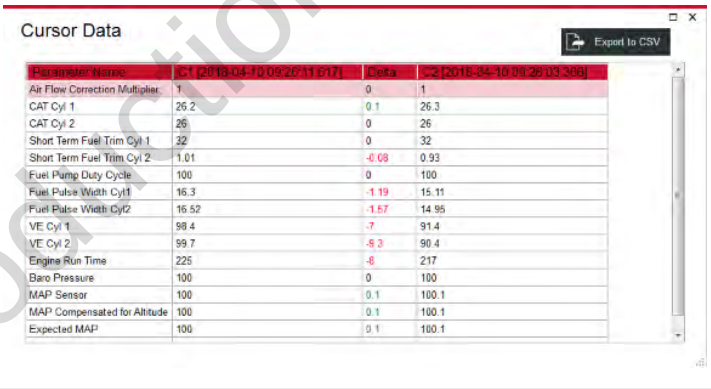


10. The Diagnostic Tool lets you compare all equipment parameters at each cursor point you place on a graph. To compare equipment parameters, click the "Display Cursor Line Data" button (Figure 54). The Diagnostic Tool displays equipment parameters for all cursors (Figure 55).

54



55



11. The Diagnostic Tool lets you export the current equipment data to CSV to review the data in another application. To export the data to CSV:

   a. Click the "Export CSV" button (Figure 56).

56

   b. The file save dialog will come into view. Select the location and enter the file name to save.

Troubleshooting

When errors occur or there are connection issues there are logs that can be pulled and sent to Briggs and Stratton for troubleshooting.

Diagnosis Trouble Code (DTC)

To get to the equipment's repair manual click on the question mark icon (A, Figure 57).

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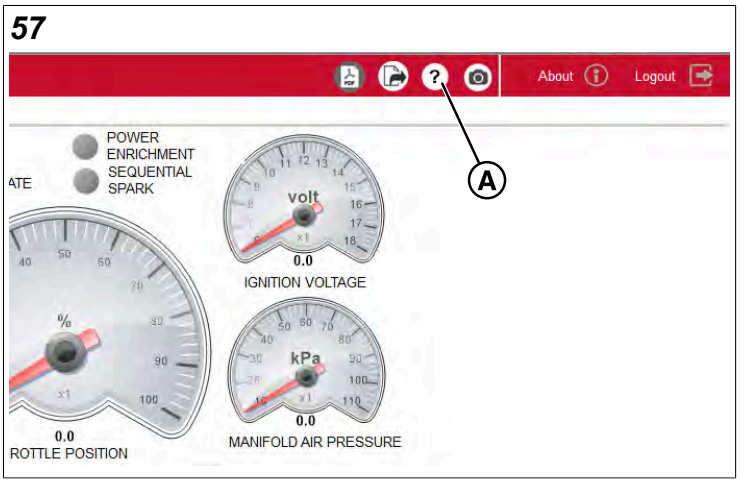
57

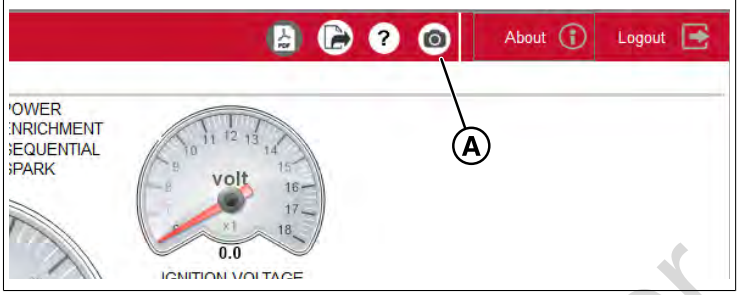


Pull Logs and Take Screenshots

Logs and screenshots need to be emailed to Briggs and Stratton for troubleshooting.

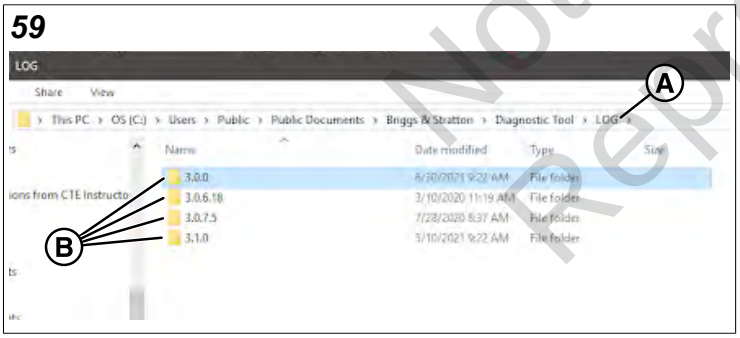
1. To take a screenshot, click the screenshot icon (Figure 58).

58



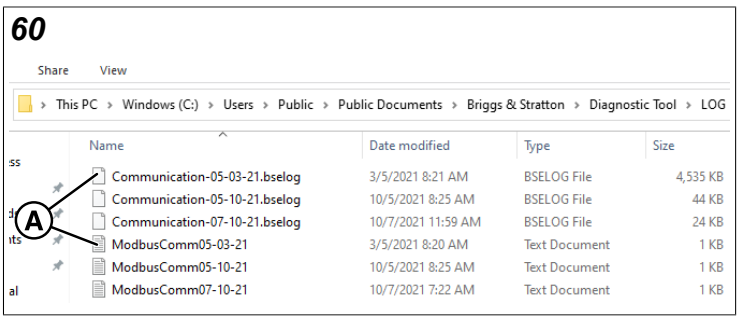
2. Save screenshots to your desktop.
3. Locate the log files. The files are located at the path shown (A, Figure 59). Make sure that you open the folder of the software version that you were using (B) when the error occurred.

59



4. Both the Communication and ModbusComm (A, Figure 60) files are necessary for troubleshooting.

60



5. Send screenshots and log files to Briggs and Stratton.

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