

Holset VGT™ Electronic Actuator

Calibration Instructions



Calibration Instructions



To help Melett customers calibrate our VGT actuators, we have prepared step by step instructions for use on popular aftermarket calibration devices.

- [Holset eTool](#)
- [ATS tester](#)
- [CIMAT Turbotest](#)

Please note, Melett Holset VGT actuators have been confirmed to be compatible with the following calibration tools:

- Holset eTool
- ATS Tester
- CIMAT Turbotest
- Turboclinic – Turboscope.

Holset eTool



Holset eTool



The following slides are typical of the process of using a Holset eTool to perform installation and calibration of the Melett VGT actuator.

Please note, some of Melett VGT actuator features differ from the OE actuator. These are as follows;

- A Span Check test cannot be performed until the actuator has been calibrated and installed.
- No time or temperature histography is recorded or reported with the eTool.
- The Hysteresis test can be performed successfully.
- The Learn test cannot be performed until after the actuator has been calibrated and installed.
- The Melett VGT actuator can be reconfigured for different physical stops settings (turbo frame sizes), which differs from OE actuators.

Holset eTool



Initial connection and configuration

Note that the Serial and Hardware part numbers are unique to the Melett actuator, as is the software version. Note that no stops data has been programmed, and that a Span Check test cannot be performed. The stops data will be set during the Calibration phase.

Configuration

Name	Value
Serial No.	4031 (0xFBF)
HW Part No.	00000004031
Software Version	2.12.7
Voltage Rating	12
Voltage Measured	12.0
Open End Stop Drift	N/A
Closed End Stop Drift	N/A

Frame Size

Span Check

Current Span: 0

Response Time: N/A

Span Check Result:

- Min Span Check
- Max Span Check
- Response Time Check

Holset eTool



Potential communication dialogue

In some cases, the error message below may appear. If it does, disconnect and reconnect the actuator and tick 'ok' to return to Configuration.

The screenshot shows the 'Configuration' window in the Holset eTool software. The 'Configuration' button in the left-hand menu is highlighted with a red box. The main window displays a table of configuration parameters:

Name	Value
Serial No.	4031 (0xFBF)
HW Part No.	00000004031
Software Version	2.12.7
Voltage Rating	12
Voltage Measured	12.0
Open End Stop Drift	N/A
Closed End Stop Drift	N/A

Below the table, the 'Frame Size' is set to 'HE4XX'. An error dialog box is overlaid on the bottom right, displaying the message: 'The actuator is disconnected. Please connect the actuator.' with an 'OK' button.

Holset eTool



Installation and Calibration

Proceed to and complete the installation and calibration, confirming a successful calibrated span value. The Turbocharger and installed actuator is now ready for use on the engine, but further testing is possible as highlighted further.

The screenshot displays the 'Install & Calibrate' workflow in the Holset eTool software. On the left, a vertical menu contains several options: 'Configuration', 'Install & Calibrate' (highlighted with a red box), 'Temperature Histogram', 'Hysteresis', 'Learn', and 'License'. The main window is titled 'Install & Calibrate' and contains the following steps and information:

- Disconnect Actuator: Confirm actuator is disconnected from turbo
- Install Position: Select "Confirm" to move the actuator to the desired install position.
- Success**
- Rotate Sector Gear Manually: Rotate to fully clockwise and select "Confirm" to continue
- Install & Calibrate: Install actuator to the turbo and then select "Confirm" to run the Calibrate routine.
- Span Limit Range 397 - 450
- Calibrated Span 447

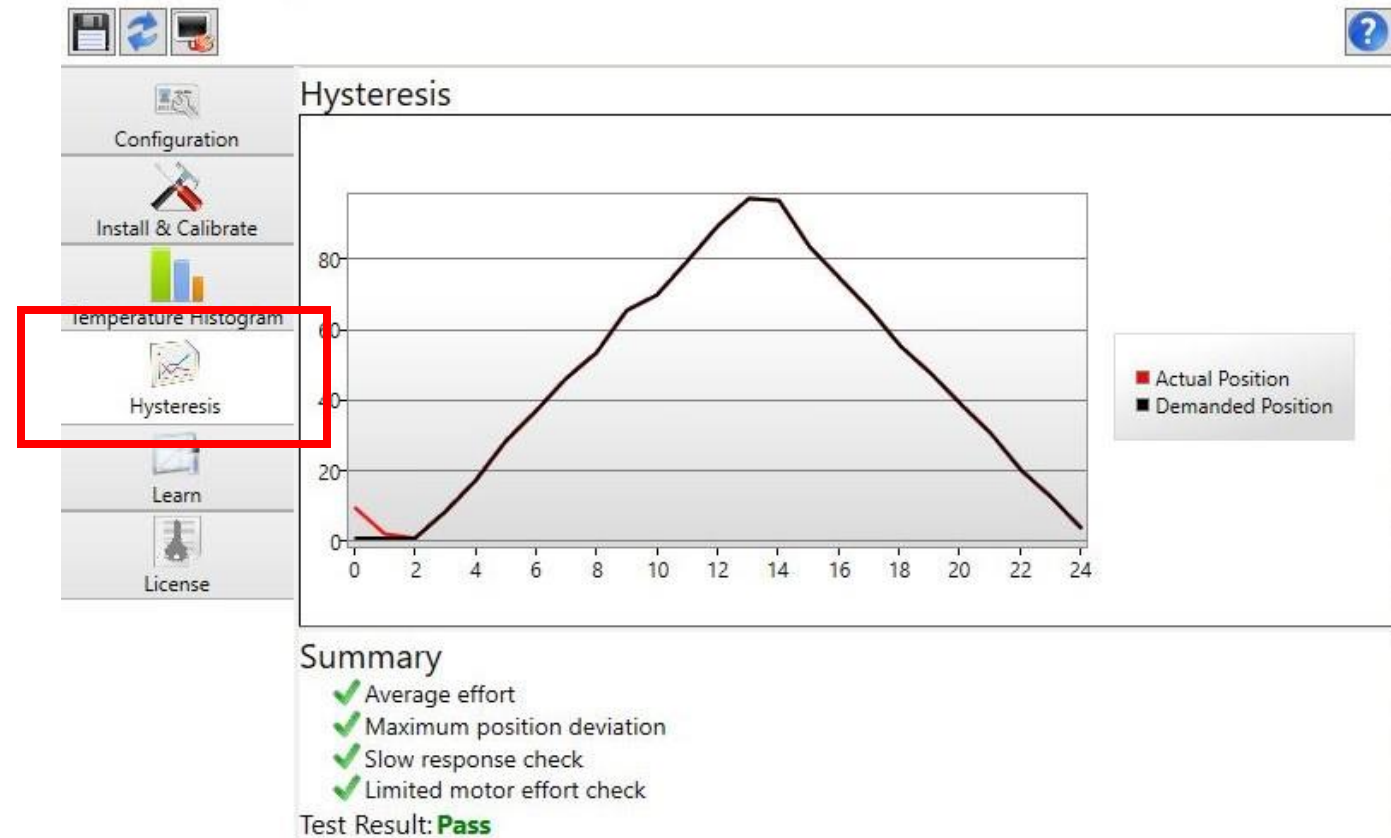
At the bottom right, there are two buttons: 'Restart' and 'Confirm'. Below the main window, the result is displayed as 'Installation & Calibrate Result: **Success**'.

Holset eTool



Hysteresis Test

Test results will be typical of an OE actuator. Due to motor design updates, the graphed lines may appear to have less resolution.

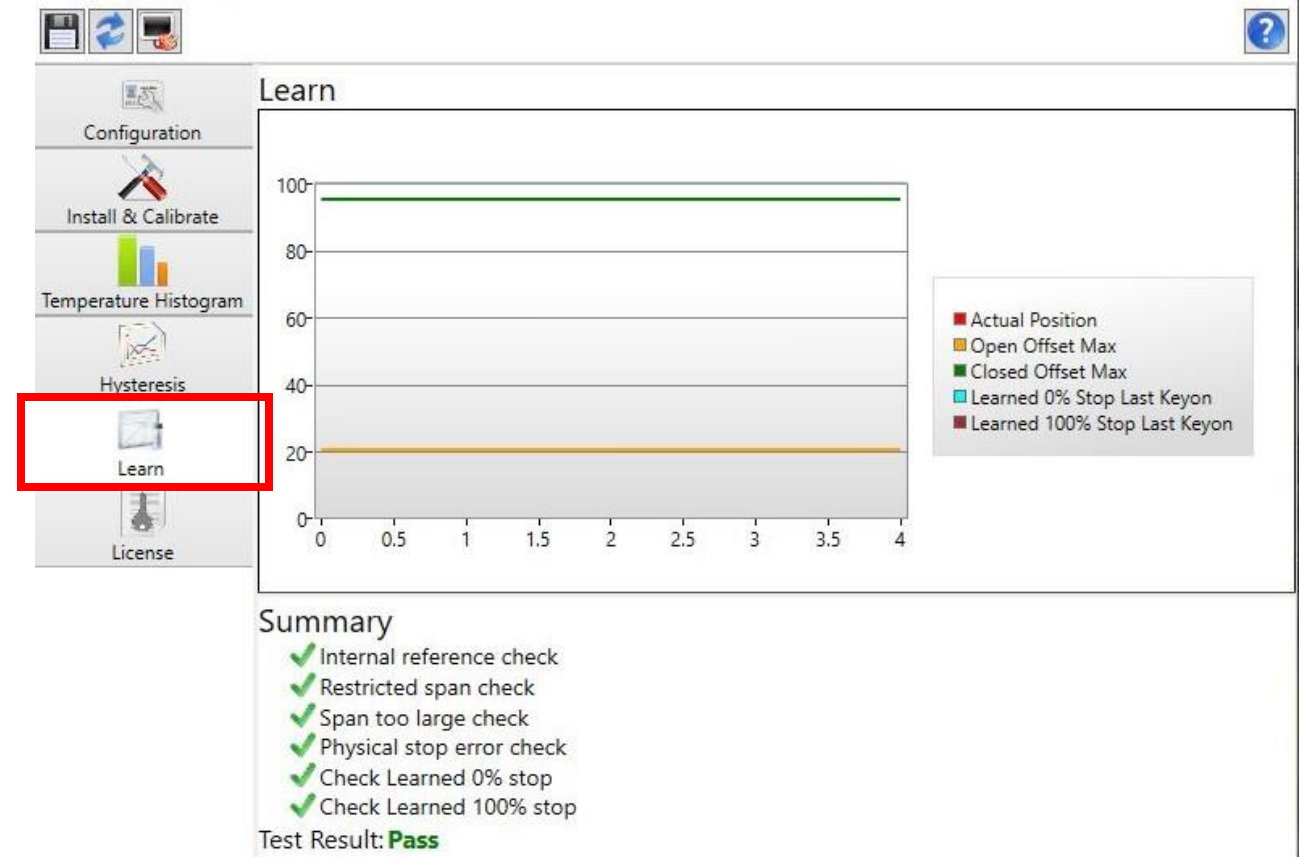


Holset eTool



Learn Test

This test must be performed after installation and calibration ONLY and will not provide a graphic representation typical of an OE actuator, but it will report the Summary data accurately and it will confirm PASS or FAIL.



Holset eTool



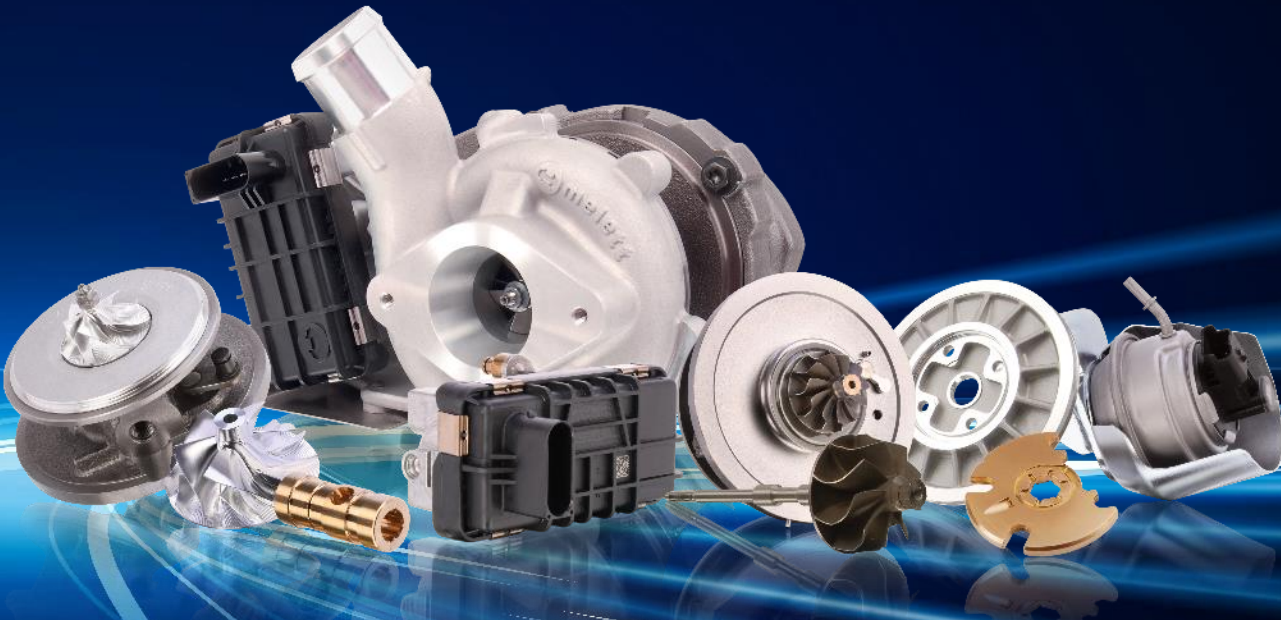
Span Check Test

As with Learn testing, this must be done ONLY after the actuator is calibrated, otherwise an error message may occur, indicating that no stops setting data has been recorded. However, after calibration, the Span Check Test can be performed and with success, it will show Span and Response Time data.

Span Check

Current Span	447	<input type="button" value="Check Span"/>
Response Time	207.4 ms	
Span Check Result: Pass		
✓	Min Span Check	
✓	Max Span Check	
✓	Response Time Check	

ATS Benchtop Tester



ATS Benchtop Tester



The process is identical to that of the OE Actuator, except that the ATS tester will report time and temperature histography data.

ATS Diesel Performance Turbo Calibration Tool

USB Working!!! Status: Operating

Commanded Position: 0

Feedback Position: 0

Actuator Load: 9

Actuator Temp: 84 °F | 29 °C

CPU Temp: 86 °F | 30 °C

Supply Voltage (12v): 12.1

Cummins HE351VE

Adapter Part Number: BT100

Part Number: 4031

Serial Number: 4031

Firmware Version: 0.0.0

Power Cycles: 1

Operating Time: 0 (Hrs) : 6 (Min)

Max Temp: 85°F | 29 °C

Manual Control 0

Oscillate Menu

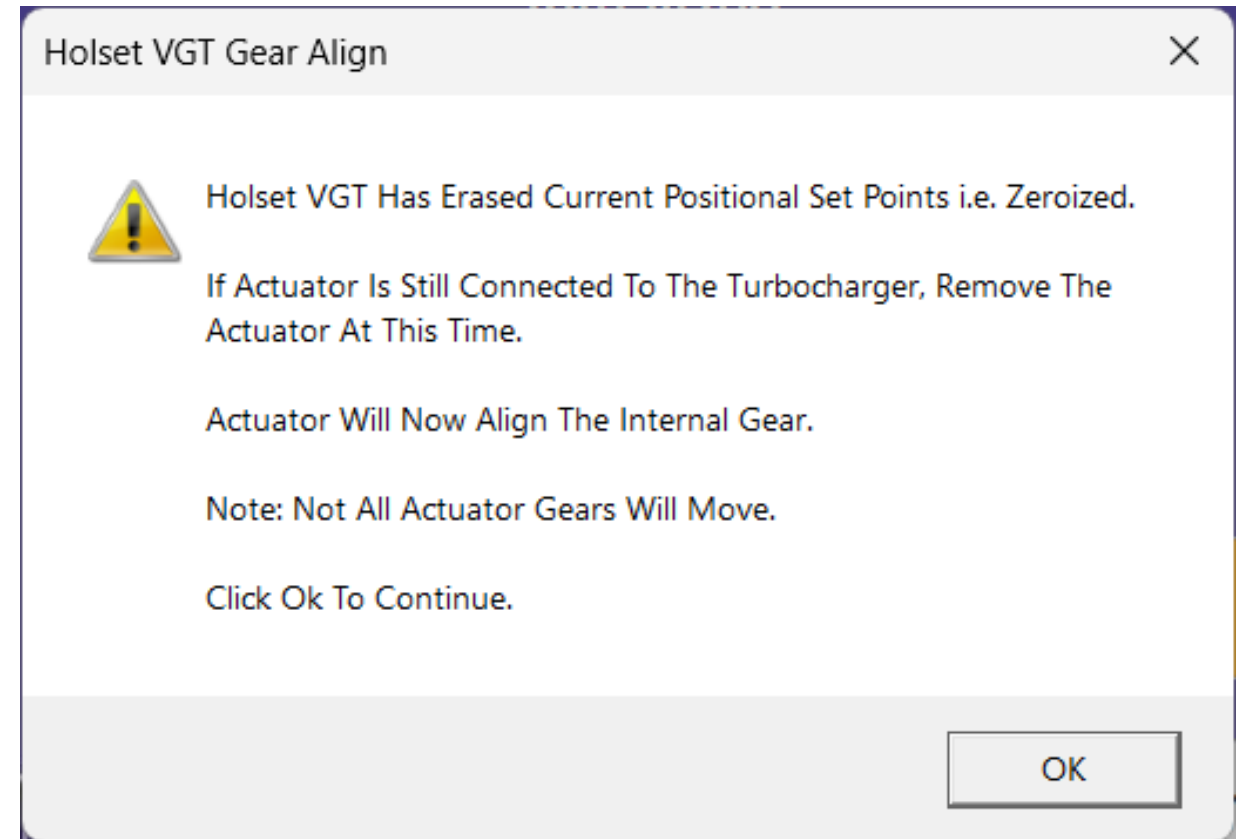
Software Version: 1.04 Firmware Version: 1.02 Serial Number: 0004018529000000

ATS Benchtop Tester



Set point calibration

The ATS tester will always erase existing set point data, prior to installation and calibration.

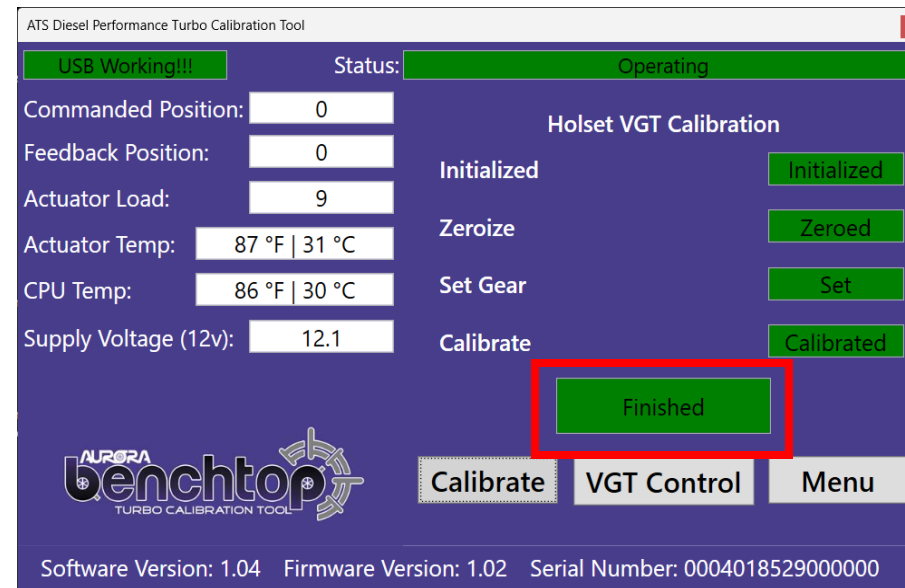
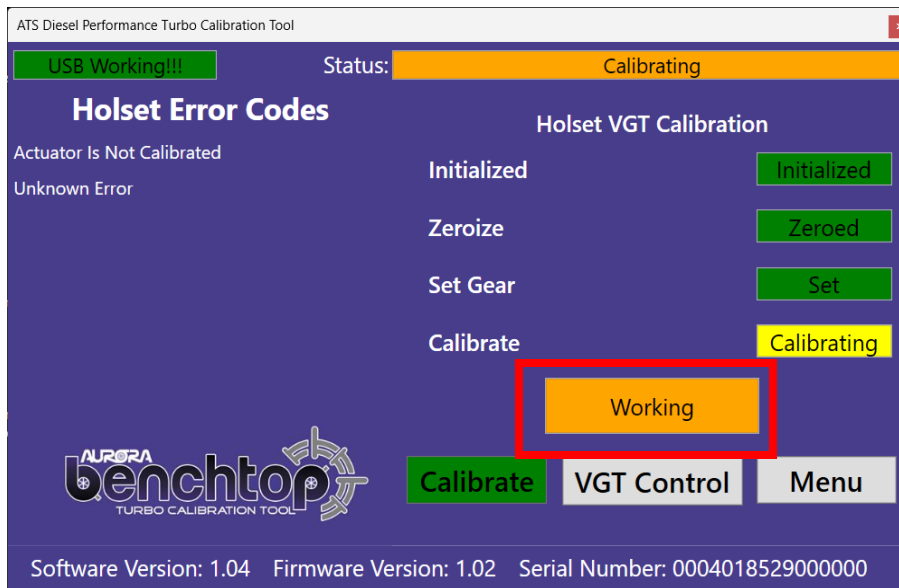


ATS Benchtop Tester



Installation and calibration

The calibration process is similar to that of the eTool and status is reported throughout the process. No further action is required after this process is complete, but further testing is possible, noted in the following slide.



ATS Benchtop Tester



Manual control

This would be similar to the eTool 'span check' or 'hysteresis' testing. Other than that, the ATS Tester allows full manual control. The screenshots below indicate manual testing of 0-100% and continued 'oscillation' testing.

The screenshot shows the software interface for the ATS Diesel Performance Turbo Calibration Tool. The status is 'Operating'. The 'Manual Control' slider is set to 0, highlighted with a red box. Other parameters include: Commanded Position: 0, Feedback Position: 0, Actuator Load: 9, Actuator Temp: 87 °F | 31 °C, CPU Temp: 86 °F | 30 °C, and Supply Voltage (12v): 12.1. The selected turbo is a Cummins HE300VG with adapter part number BT101. The interface also displays the Aurora Benchtop logo and version information.

The screenshot shows the software interface for the ATS Diesel Performance Turbo Calibration Tool. The status is 'Operating'. The 'Manual Control' slider is set to 100, highlighted with a red box. Other parameters include: Commanded Position: 100, Feedback Position: 100, Actuator Load: 9, Actuator Temp: 87 °F | 31 °C, CPU Temp: 84 °F | 29 °C, and Supply Voltage (12v): 12.1. The selected turbo is a Cummins HE300VG with adapter part number BT101. The interface also displays the Aurora Benchtop logo and version information.

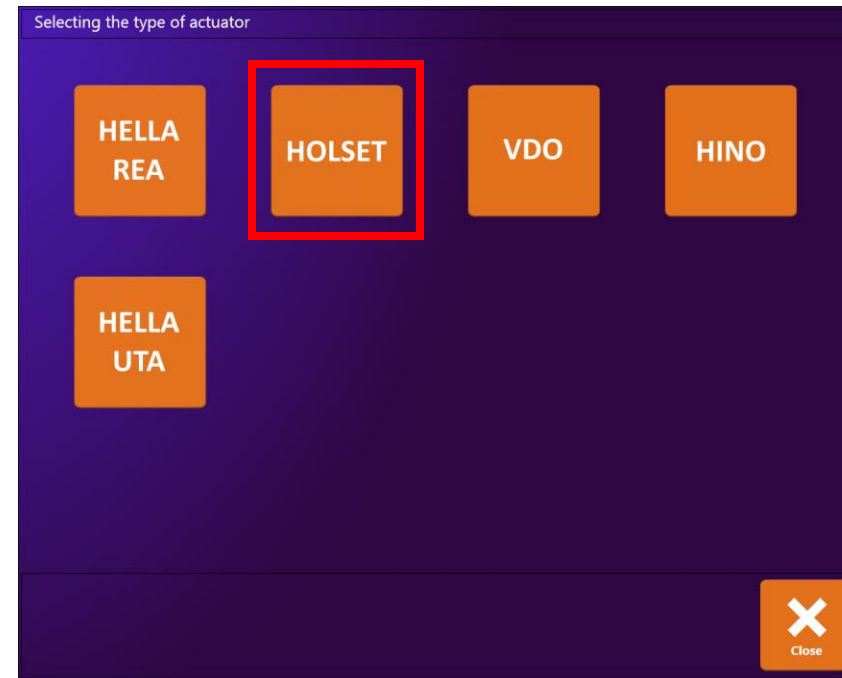
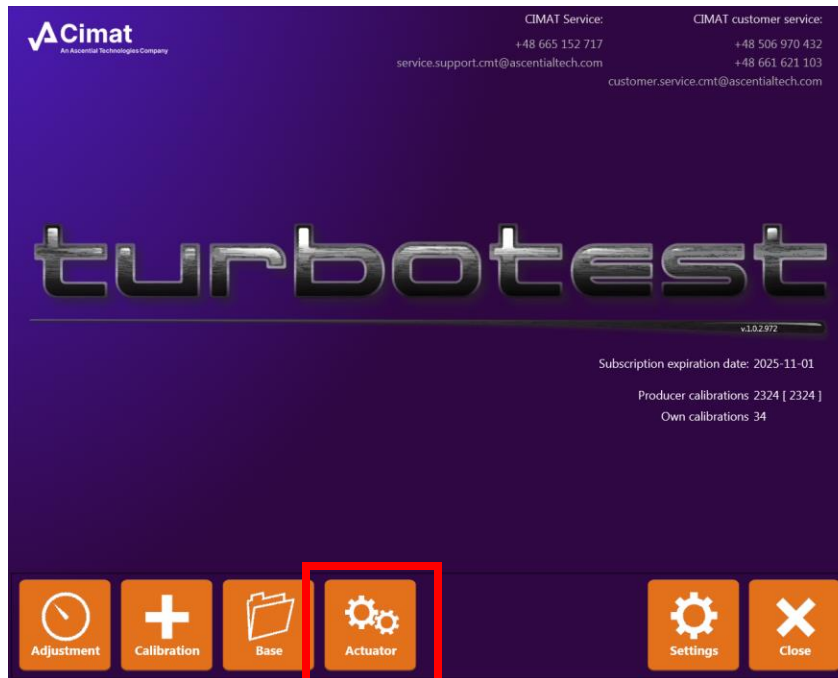
CIMAT Turbotest



CIMAT Turbotest



This process is similar to both the eTool and ATS tester, with similar reporting capabilities. The initial screen requires the operator to select the actuator type (in this case, “Holset”) to proceed.



CIMAT Turbotest



Initial connection and configuration

The correct cable is chosen, voltage selected, then the initial parameters can be confirmed, including internal part and serial numbers, software, average temperature and time in operation. From there, the command to initialize the actuator can be made, with the actuator removed from the turbocharger. Completion of the initialization process can then be followed by installation of the actuator to the turbocharger.

HOLSET

Actuator identification

Cable: R - 22

24V | 12V

Actuator

Current consumption [mA]

Current [mA]: 267,6 | Position: 511

Turn on | Turn off

Calibration | Initialization | **Parameters** | Report | Close

Actuator parameters

Serial number	4031	Part number (HW)	4031
Parameters Temperature			
Soft version	02.0<.07		
Number of cycles	1		
Average temperature [°C]	29,44		
Time (h:min)	0:12		

HOLSET

Actuator identification

Cable: R - 22

24V | 12V

Actuator

Current consumption [mA]

Current [mA]: 267,6 | Position: 511

Turn on | Turn off

Calibration | **Initialization** | Parameters | Report | Close

Actuator parameters

Serial number	4031	Part number (HW)	4031
Parameters Temperature			
Soft version	02.0<.07		
Number of cycles	1		
Average temperature [°C]	29,44		
Time (h:min)	0:12		

CIMAT Turbotest



Installation and Calibration

Once the actuator is installed, the final calibration can be made, at which point the turbocharger is ready for installation on the engine.

The screenshot shows the HOLSET software interface. On the left, under 'Actuator identification', there is a 'Cable' dropdown menu set to 'R - 22', two buttons for '24V' and '12V', and a 'Current consumption [mA]' graph. Below the graph is a table with 'Current [mA]' and 'Position' columns, both showing '0'. There are 'Turn on' and 'Turn off' buttons. At the bottom left, a 'Calibration' button is highlighted with a red box. On the right, under 'Actuator parameters', there are tabs for 'Parameters' and 'Temperature'. The 'Parameters' tab is active, showing a table with the following data:

Serial number	4031	Part number (HW)	4031
Soft. version	02.0<.07		
Number of cycles	1		
Average temperature [°C]	29.44		
Time [h:min]	0:14		

At the bottom right of the interface are buttons for 'Report' and 'Close'.

Do you want to calibrate your HOLSET actuator?

Yes No