

# 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](#)

# 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 (0xFBFB)
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 Holset eTool Configuration window. The 'Configuration' button in the left sidebar is highlighted with a red box. The main window displays the following configuration data:

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 Configuration window, 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 panel on the right 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.

At the bottom of the main panel, the following data is displayed:

Span Limit Range	397 - 450
Calibrated Span	447

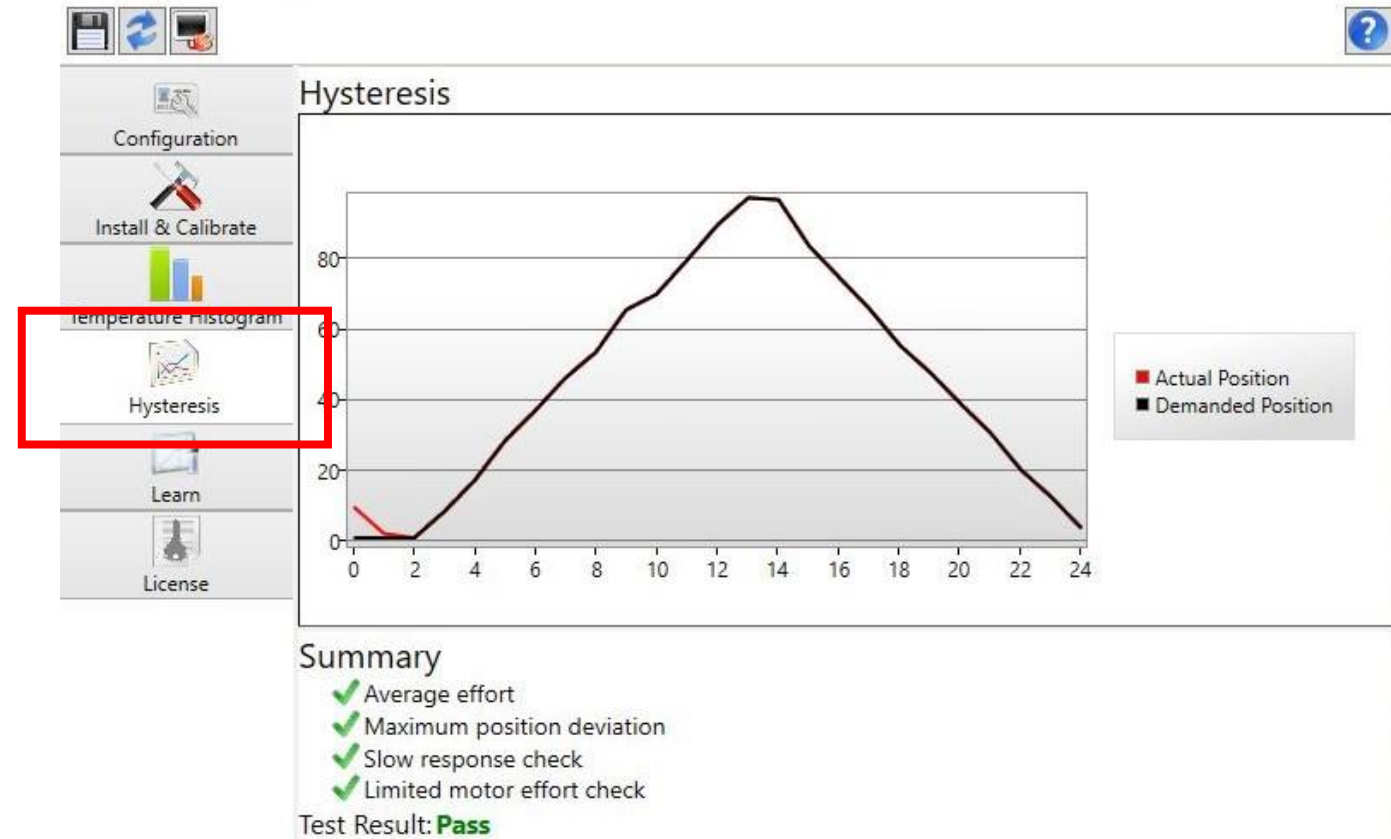
Below the main panel, there are two buttons: 'Restart' and 'Confirm'. At the bottom of the interface, the result is summarized as: 'Installation & Calibrate Result: **Success**'.

# 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.



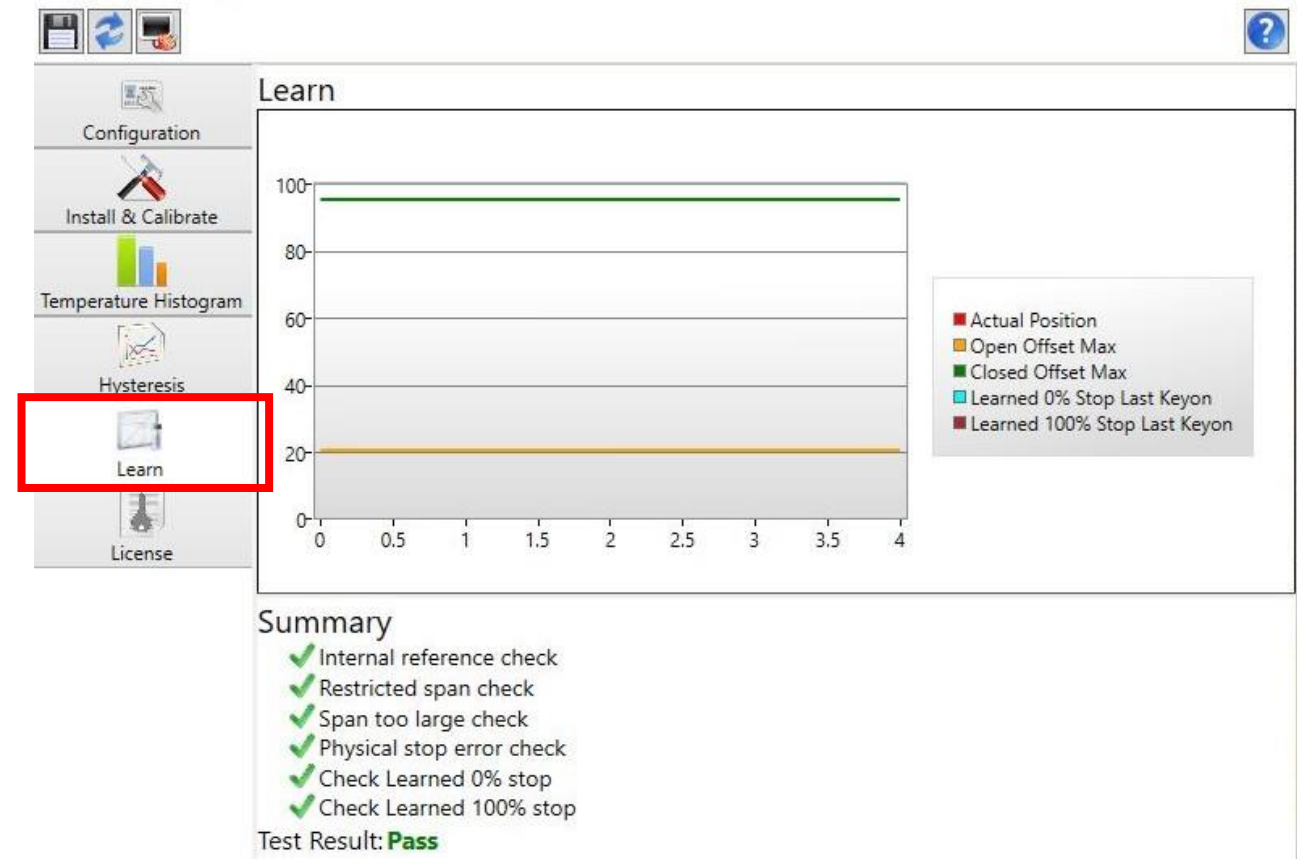


# Holset eTool



## 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: <b>Pass</b>		
✓	Min Span Check	
✓	Max Span Check	
✓	Response Time Check	

# ATS Benchtop Tester



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# ATS Benchtop Tester



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

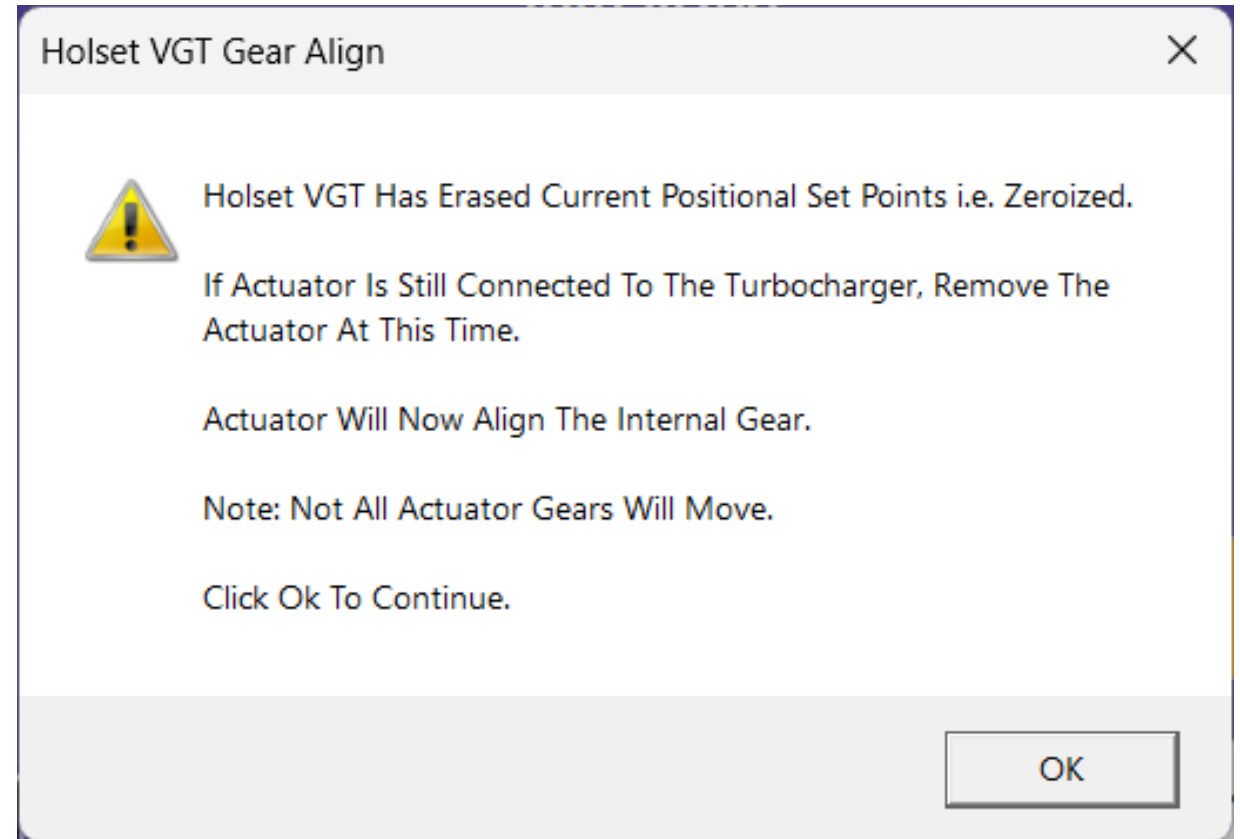


# ATS Benchtop Tester



## Set point calibration

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

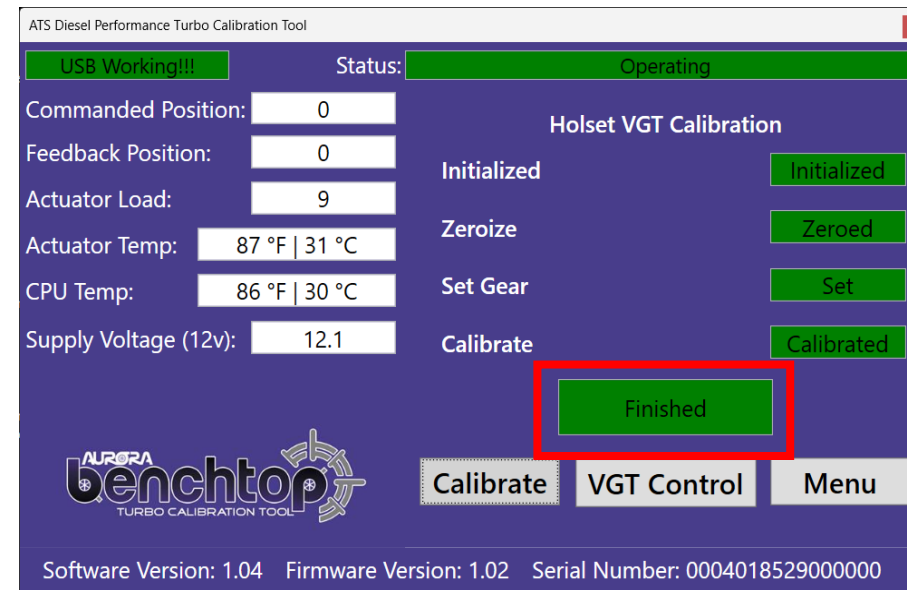
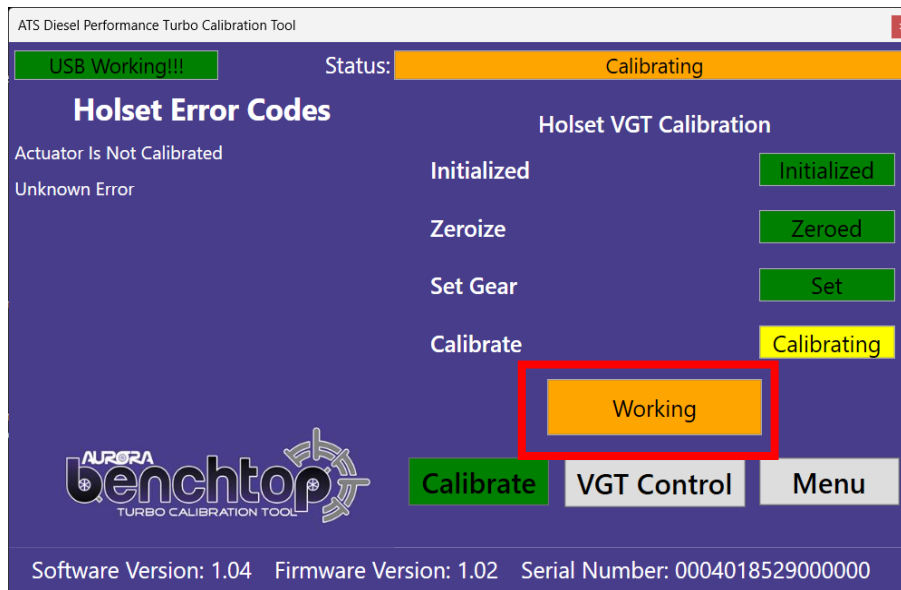


# ATS Benchtop Tester



## 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



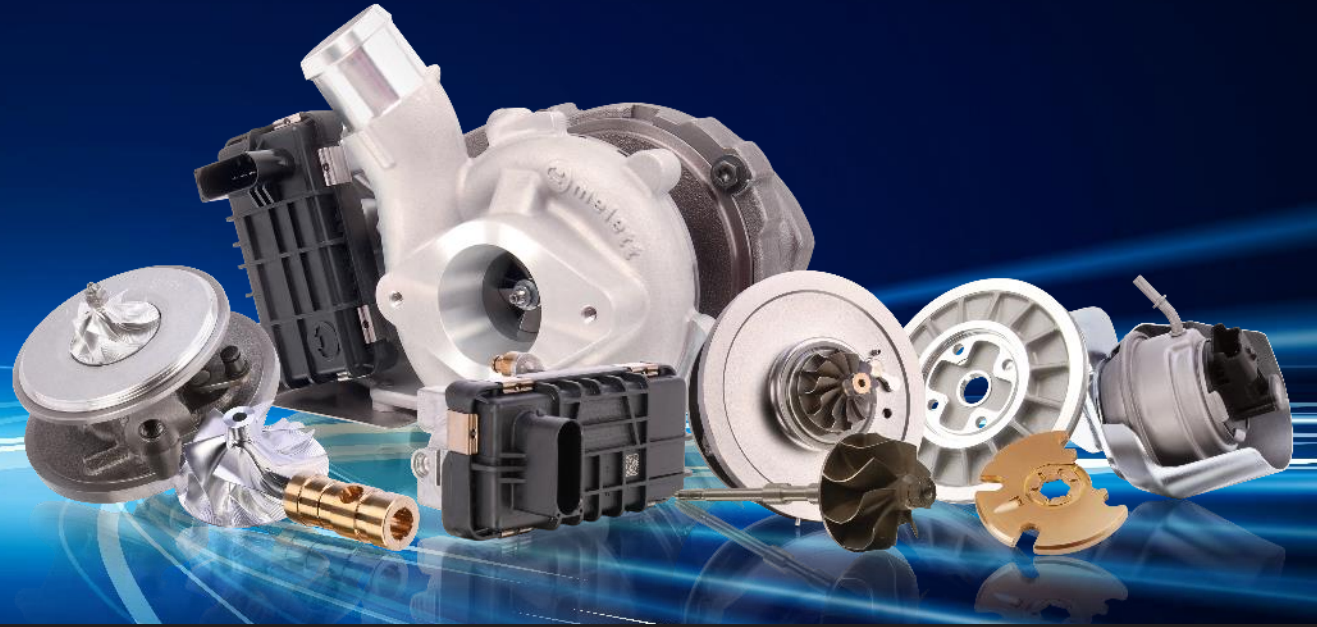
## Manual control

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 Commanded Position is 0, Feedback Position is 0, and Actuator Load is 9. The Actuator Temp is 87 °F | 31 °C and the CPU Temp is 86 °F | 30 °C. The Supply Voltage (12v) is 12.1. The Manual Control slider is set to 0, highlighted with a red box. The software version is 1.04, firmware version is 1.02, and the serial number is 0004018529000000.

The screenshot shows the software interface for the ATS Diesel Performance Turbo Calibration Tool. The status is 'Operating'. The Commanded Position is 100, Feedback Position is 100, and Actuator Load is 9. The Actuator Temp is 87 °F | 31 °C and the CPU Temp is 84 °F | 29 °C. The Supply Voltage (12v) is 12.1. The Manual Control slider is set to 100, highlighted with a red box. The software version is 1.04, firmware version is 1.02, and the serial number is 0004018529000000.

# CIMAT Turbotest

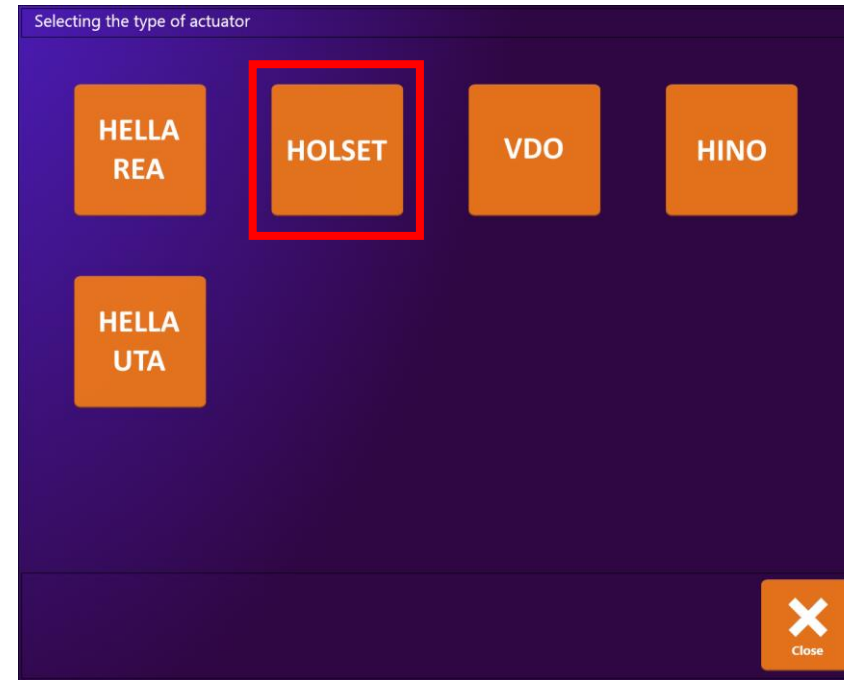




# CIMAT Turbotest



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]	Position
267,6	511

Turn on | Turn off

Parameters | Temperature

Serial number	Part number (HW)
4031	4031

Soft. version	Number of cycles
02.0<.07	1

Average temperature [°C]	Time [t:min]
29,44	0:12

Calibration | **Parameters** | Report | Close

HOLSET

**Actuator identification**

Cable: R - 22

24V | 12V

**Actuator**

Current consumption [mA]

Current [mA]	Position
267,6	511

Turn on | Turn off

Parameters | Temperature

Serial number	Part number (HW)
4031	4031

Soft. version	Number of cycles
02.0<.07	1

Average temperature [°C]	Time [t:min]
29,44	0:12

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

# 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 are 'Current [mA]' and 'Position' fields, both showing '0', and '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 fields for 'Serial number' (4031) and 'Part number (HW)' (4031). Below these are tabs for 'Parameters' and 'Temperature', and a table of parameters:

Parameter	Value
Soft. version	02.0<.07
Number of cycles	1
Average temperature [°C]	29,44
Time [h:min]	0:14

At the bottom right, there are 'Report' and 'Close' buttons.

Do you want to calibrate your HOLSET actuator?

