



Campaign Number	Revision Level	Date	Group Number
C1598		16-JAN-2015	
Expiration Date (U.S. and Canada)		Expiration Date (International)	
01-APR-2016		01-APR-2016	
Engine Family	Fuel System	Plant	Build Date
			From



## Warranty Campaign

# ISB4.5 CM2350 B104 - Variable Geometry Turbocharger Actuator Casting Porosity Campaign

### Attention

- Worldwide distr./ branches and Div./Reg Offices

If additional information is required, contact your Cummins Warranty Operations Group Leader.

### Description

This Campaign is being issued to address a casting porosity concern within the VGT actuator of the ISB4.5 CM2350 B104 engine. The Campaign requires the technician to replace **ONLY** the VGT actuator on selected engines. An actuator kit has been released specifically for this campaign, along with a service procedure to cover the work requirements.

**NOTE:** Should the actuator calibration process not complete successfully, the technician will need to replace the entire turbocharger. Please refer to the attached work instruction for details on this aspect of the Campaign.

## Action

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In order to qualify for repair under this field action, an engine:

1. will be covered In the Base Engine Warranty period, and
2. **must** be on the attached ESN list.

After verifying that the engine meets the above requirements, perform the following actions:

Please refer to Attachment B for work instructions needed to carry out this Campaign.

## Material Disposition

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Materials removed as a result of this field action **must** be scrapped.

## Reimbursements

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### Parts

**NOTE:** Where only the VGT Actuator is required, Kit number 4034163 should be used for both Truck or Bus applications. Where the entire Turbocharger is required, ensure to select the correct Turbocharger. Use part number 4309504 for all Truck applications, and use 4309505 for all Bus applications.

The following parts are covered under this field action:

Part Number	Quantity	Description
403416300	1	KIT,ACT
430950400	1	KIT,TUR (OPTIONAL)
430950500	1	KIT,TUR (OPTIONAL)

**NOTE:** SRTs to gain access that are required to complete the repair, that are sufficiently explained in the claim narrative, may also be claimed on this action.

**NOTE:** This Campaign authorizes the replacement of the turbocharger actuator. In some cases (where the calibration fails) this Campaign will also authorize the replacement of the entire turbocharger. The Labor should be claimed as follows:  
**Scenario A) Where only the actuator replacement is carried out, use the following SRTs: 00-901-00 - Administrative time 00-117-00 - Perform Job Safety Assessment (JSA) 10-144-00 - Charge Air Pipe - remove and install, each 11-074-00 - Exhaust**

**Outlet Connection - remove and install 10-014-00 - Turbocharger Oil Supply Hose - remove and install 10-021-00 - Actuator - Variable Geometry Turbocharger Electric - remove and install. Scenario B) Where the entire turbocharger is replaced, the following ADDITIONAL SRTs may also be claimed: 10-020-00 - Variable Geometry Turbocharger - remove and install 13-004-00 - Starting Motor - remove and install (Required to allow clearance to remove the turbocharger).**

**Labor using applicable Access Code and Time:**

SRT Code	Description	Time (hrs)
00-90X	Administrative time	
10-014	Turbocharger Oil Supply Hose - Remove and Install, (Common Rail Fuel System)	
10-020	VARIABLE GEOMETRY TURBO - REMOVE AND INSTALL (WITH EGR) (OPTIONAL)	
10-021	Actuator - Variable Geometry Turbocharger Electric - Remove and Install	
10-144	Charge Air Pipe - Remove and Install, Each	
11-074	Exhaust Outlet Connection-Remove and Install	
13-004	STARTING MOTOR - REMOVE AND INSTALL, ONE (COMMON RAIL FUEL SYSTEM) (OPTIONAL)	

**Travel**

Travel is covered under this field action. Towing is **not** covered under this field action.

**NOTE: When filing claims for multiple ESNs, where travel is required, travel can be filed to ONLY one (1) ESN.**

**Other Claimables**

Consumables are **not** covered under this field action.

**Claim Instructions**

For Cummins Dealers, claims for this Field Campaign **must** be filed via **RAPIDSERVE™** Web (rsw.cummins.com). For information regarding **RAPIDSERVE™** Web, please reference the "Warranty" tab in QuickServe® Online. If there are additional questions, please contact your local Cummins Distributor.

Claim Codes	
Description	Code
Account Code:	65

Claim Codes	
Description	Code
Pay Code:	Distributor = X
Pay Code:	Dealer = D
Pay Code:	International = I
Failure Code:	WTHACB

## Attachments

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[Click here to see c1598\\_esn-list.xls](#)

[Click here to see c1598\\_isb4.5\\_cm2350\\_b104\\_turbocharger\\_actuator\\_replacement\\_procedure-attach-b.pdf](#)

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**Last Modified: 16-Jan-2015**

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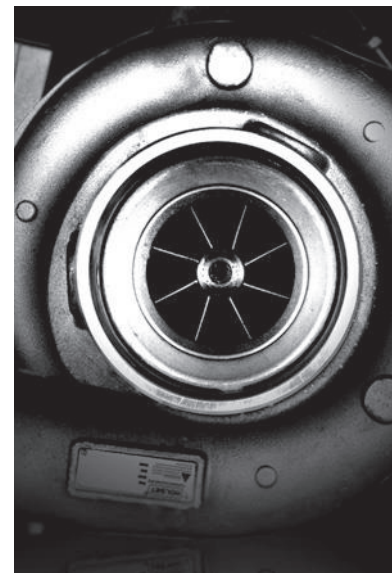
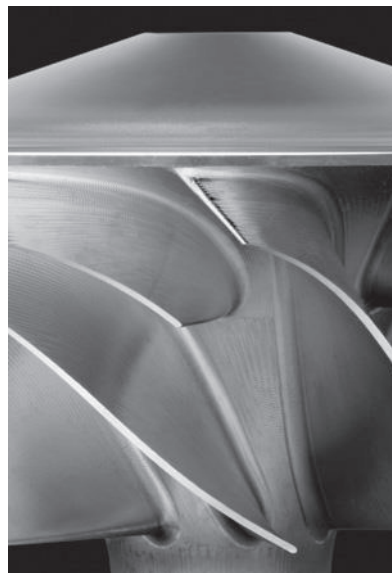
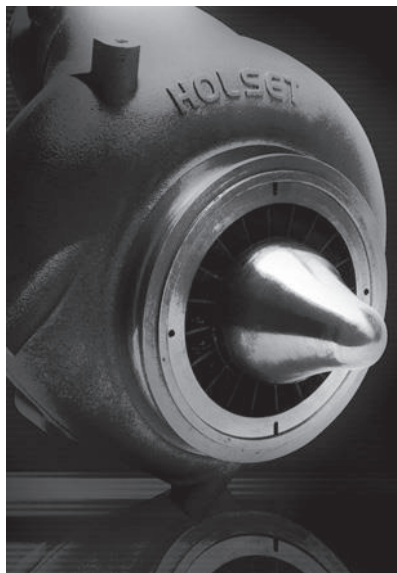
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**Turbo  
Technologies**

# ISB4.5 CM2350 B104 TurboCharger Actuator Replacement Procedure

October 2014



# Initial Steps

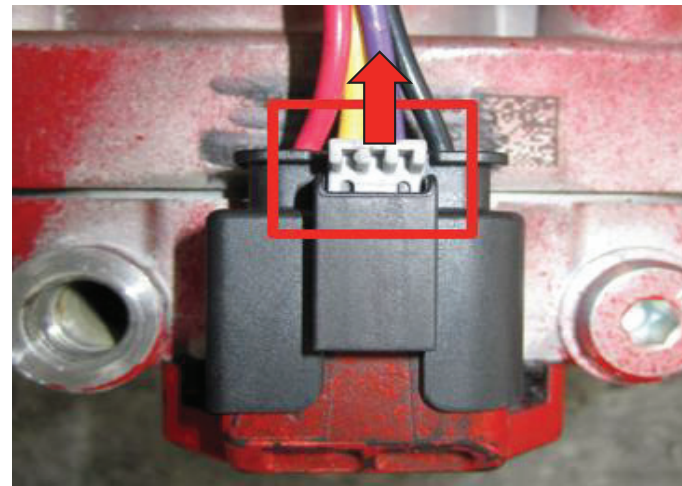
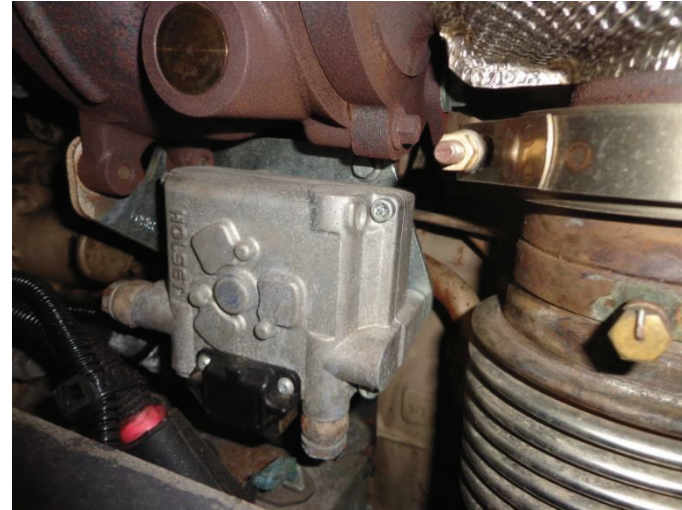
- The heat shield (where fitted), compressor outlet pipe work and turbine downpipe must be removed in order to gain access to the electronic actuator.
  
- Please refer to the following procedures to remove these components:
  1. Heat shield – [OEM Service Document](#)
  2. Charge air pipework – [010-028](#)
  3. Exhaust down pipe – [OEM Service Document](#)





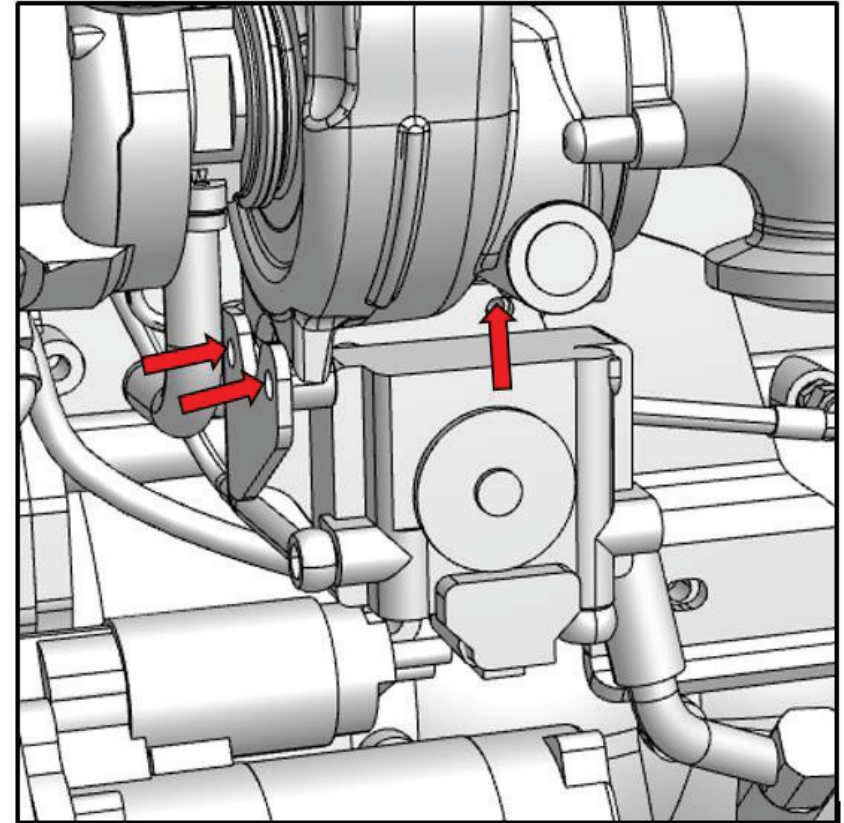
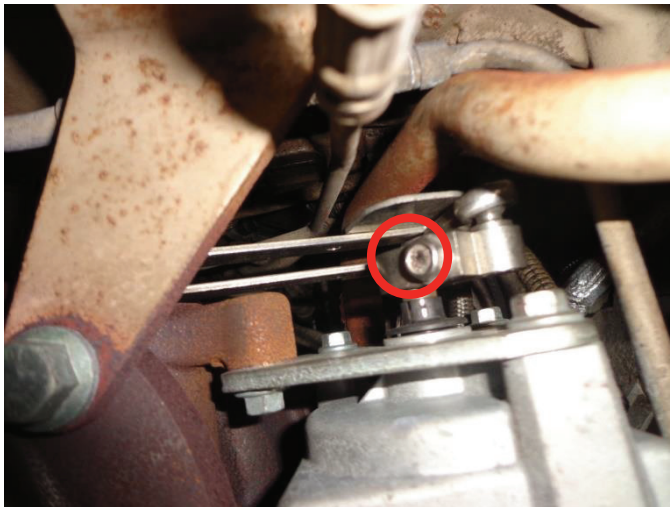
# Actuator – Connections

- The electrical connector should then be removed from the actuator. Disengage the secondary latch and remove the connector (see picture below)
- Next drain the engine coolant to a level allowing for the coolant pipes to be disconnected from the actuator. [Refer to procedure 008-018.](#)
- Remove the coolant supply and return banjo fittings from the VGT Actuator, [Refer to procedure 010-041.](#)



# Actuator - Mountings

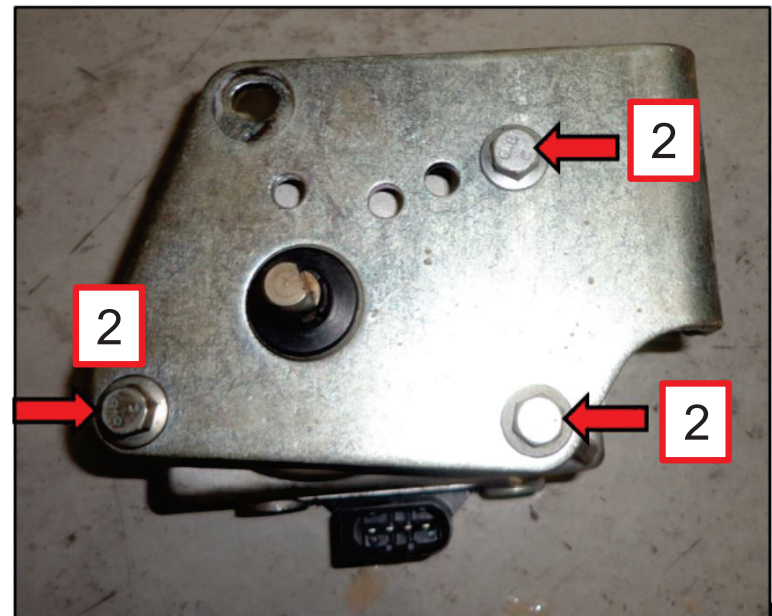
- The image below shows the bolt retaining the linkage to the actuator output, this should be loosened but not removed.
- The 3 bolts retaining the actuator bracket to the turbine housing should also be removed. This should then allow the actuator and bracket to be removed from both the turbine housing and the VG linkage.



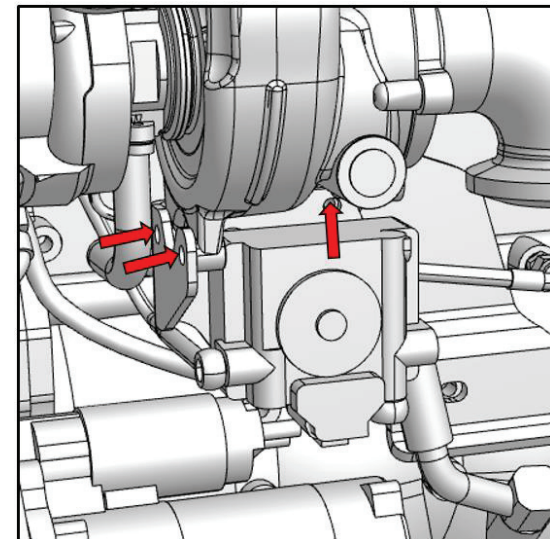
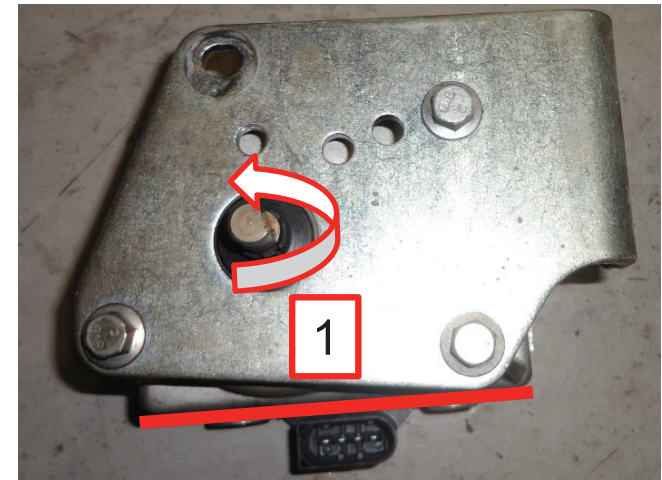


# Actuator carrier bracket change

- A M8 stud is fitted to the highlighted hole during actuator recalibration. Run a stud through the threaded hole to ensure the threads are clean. [1]
- The actuator should then be removed from the bracket.
- Fit the replacement actuator to the actuator carrier bracket [2]. **Torque value 18Nm [159 In-lb]**



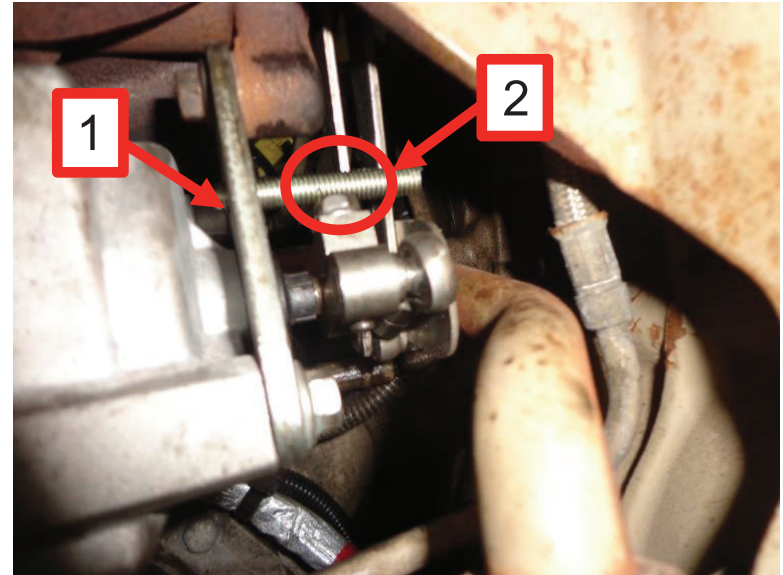
- The linkage is shaped so that it will only fit in 1 way. To aid installation, rotate the shaft on the replacement actuator by hand so that the flat is approximately parallel with the actuator's electrical connector [1].
- When refitting the actuator bracket to the turbo housing, slide the actuator linkage over the actuator shaft before installing any bolts.
- Pull the linkage towards the actuator to ensure it is fully engaged.
- The linkage bolt can now be tightened. **Torque value 9Nm [80 In-lb]**.
- NOTE: Do not use the retaining bolts to pull the actuator onto the linkage, this will cause damage to the linkage and / or the VGT actuator.
- Check the VG mechanism for full travel by hand.
- When the linkage is installed and the actuator is located, install the retaining bolts and torque to **23Nm [204 In-lb]**.



# Calibration and reassembly

NOTE: fitment of the calibration stud is aided by removing the oil feed pipe.

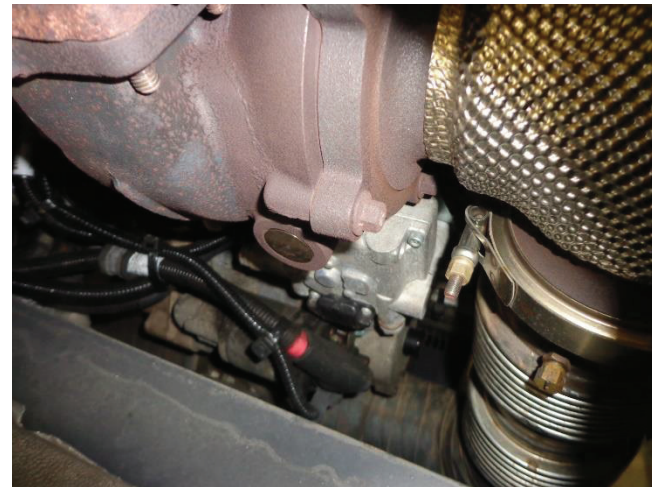
- Fit the Calibration stud [1].
- Reconnect the electrical connector, make sure to engage the secondary latch.
- NOTE: Where using a bolt in place of the calibration stud, care **must** be taken to ensure that during calibration the linkage bolt contacts the threaded section of the calibration bolt, not the head [2]
- Run the actuator calibration routine using INSITE™ (See Appendix A)
- **Once the actuator is calibrated, the calibration stud/bolt must be removed**
- Refit the turbo oil feed pipe, [refer to procedure 010-046](#).
- Refit the actuator coolant pipes, [refer to procedure 010-041](#).
- Refill the cooling system, [refer to procedure 008-018](#).





# Installation

- The exhaust down pipe can now be replaced. [Refer to the OEM Service Documentation.](#)
- The charge air pipework can now be replaced. [Refer to procedure 010-028 for instruction.](#)
- The heat shield can now be replaced. [Refer to the OEM Service Documentation](#)



# Appendix A – B104 VGT INSITE™ Actuator calibration procedure

- **NOTE: Following these installation instructions in order is very important.**
- Continue through the entire turbocharger actuator installation procedure before attempting to troubleshoot any other fault codes.
- Turn the keyswitch ON. Connect INSITE™ electronic service tool and wait 60 seconds. **NOTE: It is important that the keyswitch remain in the ON position throughout both the Install and Calibrate procedures unless otherwise directed.**
- If Fault Code 2634 becomes active, disconnect the turbocharger actuator connector from the engine wiring harness with the keyswitch ON. Connect the turbocharger actuator electrical connector. Fault Code 2634 will go inactive.
- It is normal and expected to have Fault Code 2449 active when a new turbocharger actuator is connected to the engine, because it is **not** calibrated to the turbocharger.
- Continue through the turbocharger actuator installation procedure before attempting to troubleshoot any other fault codes.
- In INSITE™ electronic service tool, go to the ECM Diagnostic Tests screen.
- From the list, select VGT Electronic Actuator Installation and Calibration, and click on the next button.
- **NOTE: The VGT Electronic Actuator Installation and Calibration is not a diagnostic test. It is the procedure to properly install and calibrate the turbocharger actuator. Running this procedure improperly can result in additional fault codes and/or damage to the turbocharger or actuator.**



# Appendix A – B104 VGT INSITE™ Actuator calibration procedure

- Locate the column labeled “Value” and left click on the down arrow. Select INSTALL ACTUATOR and select START.
- **NOTE: The output shaft on the turbocharger actuator will not move during this step.**
- INSITE™ electronic service tool will indicate when this step is complete.
- Fault Code 2449 will be active at this point in the procedure. Continue through the turbocharger actuator procedure before troubleshooting any fault codes.
- If at any point, INSITE™ electronic service tool status message indicates the procedure was stopped or failed, leave the key ON and cycle the power to the actuator by disconnecting it from the harness and reconnecting.
- If cycling power to the actuator does **not** work, unplug the actuator, turn the keyswitch OFF for 70 seconds, and restart INSITE™ electronic service tool. Then start over, beginning with the actuator INSTALL step.
- The turbocharger actuator **must** be calibrated to the turbocharger. This step **must** be performed to make sure of proper turbocharger operation.
- The INSITE™ electronic service tool CALIBRATE ACTUATOR command **must only** be run with the actuator mounted to the turbocharger.
- In INSITE™ electronic service tool screen labeled VGT Electric Actuator Install and Calibrate, locate the column labeled Value and left click on the down arrow. Select CALIBRATE ACTUATOR.

# Appendix A – B104 VGT INSITE™ Actuator calibration procedure

- Follow the instructions on the screen to calibrate the turbocharger actuator to the turbocharger. INSITE™ electronic service tool will indicate when this step is complete.
- If INSITE™ electronic service tool status message indicates the procedure was stopped or failed, turn the keyswitch OFF for 70 seconds, then turn the keyswitch ON. Then start over, beginning with the INSTALL ACTUATOR instructions.
- If the CALIBRATE ACTUATOR step does **not** pass, restart with the Install section.
- It is normal to have an active Fault Code 2387 at this point.
- Turn the keyswitch to the OFF position for 70 seconds. Turn the keyswitch ON and refresh the fault code screen. All turbocharger actuator fault codes should be inactive. Use INSITE™ electronic service tool to clear all fault codes.
- Make sure all turbocharger fault codes are inactive and cleared before adding coolant to the engine.