

** SOLUTION **

| Title | Diagnostic Trouble Codes (DTC) P20EE And P103C, Diagnostic Procedure; REPLACE S GUIDED DIAGNOSTICS IN PREMIUM TECH TOOL (PTT) - US17+OBD16 Through US17+OBD2018 Emissions, Model Years 2018 And 2019 |
|-------------------|--|
| Mack Models | |
| Mack Model | LR, MRU - TerraPro, TE - TerraPro, AN - Anthem, CHU - Pinnacle, Axle back, C XU - Pinnacle, Axle front, GR - Granite, GU - Granite, PI - Pinnacle |
| Volvo Models | |
| Volvo Model | VNL, VNM, VNR, VAH, VHD |
| Emission Standard | |
| Emission Standard | US17+OBD16, US17+OBD18 |
| Engine family | |
| Engine family | 11L Engine, 13L Engine, MP7, MP8 |
| ** SOLUTION ** | |
| Cause | Procedures and checks to follow for P20EE and P103C on US17+OBD2016 and |

US17+OBD2018 chassis.

Soluti on

5 JANUARY 2020 UPDATE

There is no longer an eService case required for ANY STEP of the process below. A case should ONLY BE OPENED if further assistance is required to complete diagnosis.

If test results determine an SCR replacement is required, A CASE IS NOT REQUIRED TO ORDER A REPLACEMENT.

Cases submitted solely to request approval to replace an SCR WILL BE REFUSED.

PRIOR TO PROCEEDING

Review open campaigns for the vehicle and ensure that it is NOT listed for Recalls EC0020a, EC0022a, EC0022b, or EC0022c.

IF THE CAMPAIGN APPLIES TO THE VEHICLE:

- No diagnostics are necessary.
- No eService case is necessary.

Follow the recall instructions if the vehicle is listed. This solution should only be utilized if the vehicle is not included in any of the recalls.

CASES AND DIAGNOSTIC TIME REQUESTS OPENED FOR CHASSIS AFFECTED BY ONE OF THE ABOVE RECALLS WILL BE REFUSED.

If this solution is being reviewed for P225E-00, solution <u>K15560422</u> must be utilized <u>FIRST</u>, and this solution should only be followed if the NOx sensors are determined to be functioning properly. The tests performed in <u>K15560422</u> do not need to be duplicated for this solution.

The following checklist should be used for diagnosis of P20EE or P103C on GHG17 chassis <u>instead of Guided Diagnostics</u>.

DO NOT REPLACE ANY PARTS UNTIL ALL ACTIVITIES LISTED IN THIS CBR ARE COMPLETE.

NOTE: The Malfunction Indicator Lamp (MIL) may still be lit even if P20EE shows inactive on a DTC Readout.

I. Vehicle Emissions Level

Review the vehicle emissions level

• Details can be found in the Product Details box on the Product tab in PTT as seen below:

| ech Tool | *-materia | ing P States in | | | | | |
|--------------|----------------|-----------------|-------|-------------------|--------|-----------|--|
| Tech Tool | Links Help | | | | | | |
| Product | Product Histor | ry Diagnose | Test | Calibrate | rogram | Impact | |
| Selected | d Product (N | 997222) | | | | | |
| 😘 Refres | h 💮 Settings | Q Manual Sele | ction | 🕒 Latest Selectio | ns 🗄 | OBD/LVD 🔻 | |
| Product Det | tails | | | | | | |
| Chassis ID | : | | | VIN: | | | |
| N 997222 | | | | 4V4N | 9EH2JN | 997222 | |
| Model: | | | | Comp | any: | | |
| VN | | • | | Volvo | Trucks | | |
| Emission L | _evel: | | | | | | |
| US17 + OB | D2016 | | | | | | |
| Electrical S | System: | | | | | | |
| VERSION3 | | | | | | | |

- If the vehicle is US17+OBD16 or US17+OBD18:
 - Perform Sections II and III below.

II. Vehicle History

- The following information should be obtained prior to beginning diagnosis.

- Is this the chassis's first visit to the dealer for either of these codes?
- Have there been any previous failures or problems that may have caused problems with the Exhaust

Aftertreatment System (EATS)?

Examples:

- Turbocharger failure
- EGR Cooler failure
- Coolant passage through the exhaust
- Excessive fuel through the exhaust (Injector failure, AHI failure)
- DPF failure
- Contaminated DEF

III. Check the DTC Readout

- Are there any other NOx sensor DTCs present?

- P225E and P0422 are very similar to P20EE and should be checked with the same steps below.
- Any other NOx sensor codes may suggest intermittent NOx sensor failure.

- Are there any codes present for other engine components that would indicate an issue contributing to or causing either P20EE or P103C?

• Examples:

EGR System Fuel System (Includes AHI) Turbocharger/Boost DPF Exhaust temperature

IV. Check SCR Efficiency Evaluations

- SCR Efficiency values can be found in Premium Tech Tool (PTT) Operation 2589-08-03-05 Aftertreatment Selective Catalytic Reduction (SCR) System.

| Product Hi | istory Diagnose Test Calibrate Program In | ipact |
|--|---|---|
| 20EE or P alues - NO) 80 % 72 % 73 % 73 % 76 % | 103C vSCR Monitor Data Minimum fault limit Evaluation (Most recent) Evaluation 2 Evaluation 3 Evaluation 4 Evaluation (Oldest) | Construction Conditions >> Execution Conditions >> Executions Conditi |
| 207F | | Test result |
| alues - DEF | Dilution Monitor Data | Select one of the following alternatives |
| 71 % | Minimum fault limit | • |
| | | Continues |

• The last five efficiency evaluations are displayed as shown in the screenshot above.

If all five tests are below the fault limit, SCR conversion has been poor for an extended amount of time.

If only one or two are below the fault limit, conversion is only intermittently poor.

- Information on driving conditions when the poor conversion is occurring may provide insight into the cause of the codes.

V. SCR System Checks

All steps below should be performed to verify proper function of each component.

1. Check DEF quality with a refractometer

2. Physically check for any contamination in the DEF tank

- Examples
 - Dirt or Debris
 - Coolant
 - Water
 - Fuel
 - Oil

3. Physically inspect the DEF Dosing Valve, Diffuser Pipe, and SCR Inlet for crystallized DEF

• Ensure there is no significant/excessive crystal buildup in any component.

NOTE: A small amount of crystal accumulation is normal.

• If significant accumulation is noted clean it as first step and then ensure that the DEF dosing valve is correctly installed with all gaskets and clamps positioned properly.

4. Perform DEF Dosing Test 2 to confirm proper function

• Located in Operation 2589-08-03-05 Aftertreatment Selective Catalytic Reduction (SCR) System. Test B from the first screen of the operation • Test two is the Small Dosing Test

The test should be run twice and results noted to an accuracy of 2 milliliters Nominal Volume is **55 mL**

- Acceptable range is 55 mL \pm 3 mL
- 5. Check the Main Software part number for the Engine Control Module (EMS).
 - If vehicle has Turbo-compound system, then do not update EECU SW. Only EECU MSW 23470187 and older have capability to run NOx conversion test on Turbo-compound vehicles.
 - If vehicle has VGT system, then update EECU MSW to 23766686 or newer.

6. If vehicle has a Turbo-compound System run NOx Conversion, Operation 2549-08-03-03. (only possible if vehicle still has 23470187 and older EECU MSW).

7. If vehicle has a VGT System run Exhaust After-treatment System Analysis, Operation 2589-08-03-18. Make sure to evaluate only NOx sensors and SCR using this test (Please attach pictures emailed).

VI. eService Case

If further assistance is required to complete diagnosis and an eService case is opened, the case <u>MUST</u><u>INCLUDE</u>:

- 1. The vehicle history as described in Section I.
- 2. A complete DTC Readout from the time of the vehicle's arrival.
- 3. Screenshots of:
 - SCR Efficiency values as shown in Section III
 - The NOx Conversion Test as shown in the picture in Section IV.

NOTE: Refer to CBR Solution K52225504 - Methods For Taking A Screenshot

4. A description of findings for each item checked in Section IV, **including numerical values for the dosing tests** ("Good", "Okay", "In spec", etc. are not acceptable values).

| Internal comments (BO) | For OBD2019 and Newer vehicles (Truck MY2020+), there is a new CBR. |
|------------------------|---|
| | GHG2017 and OBD2018 vehicles have Exhaust Aftertreatment System Analysis Test (2589-08-03-18), which helps evaluate NOx sensors, DEF dosing valve and SCR in one ~30 minute test with wk1945+ EECU MSW (P/N 2376686 or newer) releases. We do not have capability to run either NOx conversion or EATS Diagnostics Test (2589-08-03-18) on Turbocompound Vehicles. |
| Solution visibility | Dealer distribution |

| Function affected | Diagnostic tool, DEF Dosing, SCR |
|--|---|
| Function Group | |
| Function Group | $254\ catalytic\ converter;\ exhaust\ emission\ control\ equipment\ ,\ 258\ emissions\ after-treatment$ |
| Customer effect | |
| Main customer effect | regeneration, diagnostics/methodology, efficiency/abnormal behavior, fault code /display |
| Fluid implicated | Diesel Exhaust Fluid (DEF) |
| Fault Codes And Error | Codes |
| OBDII Diagnostic Trouble Codes (P, U, B Format) | P0422-00, P103C-00, P20EE-00, P225E-00 |
| Conditions | |
| Vehicle operating mode | when driving, when stationary |
| Frequency of occurrence of problem | random |
| Administration | |
| Author | UT0031H |
| Dealer ID | UT0031H |
| Last modified by | A241298 |
| Creation date | 05-06-2018 17:06 |
| Date of last update | 27-04-2020 14:04 |
| Review date | 01-10-2018 00:10 |
| Status | Published |
| Average score | 3.75 |
| Number of scores | 4 |
| NA_Reviewer | ut0031h |
| NA_Author_Group | GTT |

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Solution K52225504 Monday, April 27, 2020 5:57:24 PM CEST

** SOLUTION **

| Title | Methods For Taking A Screenshot / Screen Capture For eService Cases Or Other Use; |
|-------------------|---|
| | Premium Tech Tool (PTT) And Other Software |
| Mack Models | |
| Mack Model | LEU, LR, MRU - TerraPro, TE - TerraPro, AN - Anthem, CHU - Pinnacle, Axle |
| | back, CXU - Pinnacle, Axle front, GR - Granite, GU - Granite, PI - Pinnacle, TD - |
| | Titan, CH, CHN, CL, CT, CTP713, CTP713B, CV, CX, CXM, CXN, CXP |
| | $612,\mathrm{CXP}613,\mathrm{CXU}613,\mathrm{DM},\mathrm{DM}6,\mathrm{DMM},\mathrm{FDM},\mathrm{LE},\mathrm{LE},\mathrm{MH},\mathrm{MR},\mathrm{MR}6$ |
| | , RB, RB6, RD, RD6, RD8, RM6, RW6, RW7 |
| Volvo Models | |
| Volvo Model | VN, VAH, VHD, VT |
| Emission Standard | |
| Emission Standard | US04, US07, US10, US10+OBD13, US14+OBD13, US14+OBD15, US14+OBD |
| | 16, US17+OBD16, US17+OBD18 |
| Engine family | |
| Engine family | 11L Engine, 13L Engine, 16L Engine, MP7, MP8, MP10, CU15, CU12 CNG, |
| | CU9 CNG, CU9 |
| ** SOLUTION ** | |
| Cause | Many different situations, eService activities or otherwise, may necessitate taking |
| | screenshots, or screen captures, of operations or information in PTT or other programs |
| Solution | Juarvian |

There are a variety of reasons a screenshot may be needed for review. Diagnostic Trouble Code Readouts, PTT errors, product or control unit information, diagnostic test results, steps and messages, and oscilloscope readings name a few.

There are tools available to capture a screenshot, and Windows itself also has the ability to copy a screenshot to the clipboard without launching a program. This solution will cover the two methods that can be used on most every computer. If there is other imaging software installed on a computer that allows screen captures (Snagit, Jing, and FastStone Capture are a few examples), the software instructions will need to be followed.

Procedure

I. Using The Windows Snipping Tool

Computers running Windows XP or newer (Windows 7, Windows 8, Windows 10) have the Snipping Tool utility installed as part of the Windows software package. The Snipping Tool allows shots to be taken of specific parts of the screen, speeding the process of capturing and saving a screenshot.

For Windows XP, Windows 7, and Windows 10:

1. Click on the Start Menu, then mouse over or click on All Programs:



2. Scroll through the list of programs and find the Accessories folder:

| 🔯 Windows Media Player | * |
|-----------------------------|---|
| 🛹 XPS Viewer | |
| Accessories | |
| 📗 Adobe LiveCycle ES3 🛛 🔏 | |
| 📗 Autodesk | |
| 🃗 Cisco IP Communicator | |
| 🃗 Cisco Systems CTI Toolkit | |
| ContactAtOnce! | |
| 📗 Games | |
| 🃗 Gamut | |
| Hive Streaming | |
| MACK Software | |

3. Click on the Accessories folder, then find the Snipping Tool. Click to open the program.



For Windows 8:

1. Click the Start button to bring up the Start Screen



2. Click the Search button (magnifying glass) in the upper right-hand corner of the screen



3. Type "Snipping" into the search bar. Click on Snipping Tool to open the program



For all Windows versions:

4. The Snipping Tool will open ready to capture a shot. The cursor should change to a cross icon. If the capture doesn't start automatically, click the New button in the Snipping Tool Window.

4a. Move the cursor to where one corner of the screenshot should be. Click and hold the left mouse button, then drag the mouse to the opposite corner of the desired shot:

| lech Too | A CONTRACTOR OF A CONTRACTOR OFTA CONT | | |
|--|--|--|------------|
| Tech To | I Links Help | | |
| Produc | t Product History Diagnose Test Calibrate Program Impact | | |
| Selec | ted Product (N 997222) | | |
| GR | fresh 🔞 Settings 🔍 Manual Selection 🕲 Latest Selections 🖺 OBD/LVD 🗸 | | |
| Produc | Details | Product Status | • × |
| Chassi N 9972 VN Emissi US17 • Electri VERSI | s ID: VIN: 22 AVXNODEH2JN007222 Company: Velvo Truckis OBC0216 call System: N3 | Status Description Control unit informa Des the cursor around the area you want to capture. | ja Options |
| Connec | tivity | Campaigns (0) | |
| Status | Description | There are no available campaigns for this product. | |
| • | VOCOM I (USB) is not connected to the computer. | | |
| • | The selected product N 997222 is not connected to VOCOM I. | | |
| 0 | Analysis Barla Barla and | \$2/29/2017 2:50/22 PM | |

4b. When the left mouse button is released, Snipping Tool will capture the highlighted area and open it in a preview window:

| Product Product H | istory Diagnose Test Calibrate Program Impact | |
|-----------------------------------|---|---------------------|
| Selected Produc | it (N 997222) | |
| G Refresh Tas | ninoing Tool | |
| roduct Details | Edit Tools Help | |
| Chassis ID: N 997222 | New 🖬 🗈 🕤 - 🚺 🖉 | |
| Model: | ey Tech Tool | |
| VN | Tech Tool Links Help | |
| Emission Level: US17 - OBD2016 | Product Product History Diagnose Test Calibrate Program Impact | |
| Electrical System VERSION3 | Selected Product (N 997222) | |
| connectivity | 😘 Refresh 🕘 Settings 🔍 Manual Selection 🕲 Latest Selections 🖹 OBDALVD - | |
| Status Description | Product Details | |
| vocom The select | Chassis ID: ' VIN: N 997222 4/4NC9EH2JN997222 | |
| Central D | Model: Company: | 1 |
| | VN Volvo Trucks | |
| | Emission Level: | |
| | US17 + 08D2016 | |
| | Electrical System: VERSION3 | |
| | Connectivity | |
| | Status Description | |
| | VOCOM I (USB) is not connected to the computer. | |
| | The selected product N 997222 is not connected to VOCOM I. | |
| | Central Data Retrieved: 12/2 | 8/2017 3:10:22 PM + |
| × | | • |

5. If a shot of a complete window is needed, click the dropdown icon (down arrow) next to the New button in the Snipping Tool and select Window Snip. Clicking once on the desired window to copy will open a screenshot of the full window in the preview pane:

| Snipping Tool | | | | | |
|---------------|------------------------------------|---|--|--|--|
| R | New V Cancel Options | | | | |
| | Free-form Snip Rectangular Snip | 0 | | | |
| • | Window Snip | | | | |
| | Full-screen Snip | | | | |

6. Click on the Save (Disk) icon in the preview window. Save the file to desktop or a folder where it can be located. Attach the file to the eService case as needed.

II. Using The Print Screen Key

1. If the screenshot will be of a specific window, make sure the window is maximized first.

| | | x | h |
|---|----|----|----|
| | - | 00 | 21 |
| _ | -7 | | |

2. To capture a screenshot of the full screen, press the Print Screen key on the keyboard. **NOTE:** M any laptops have Print Screen sharing a key with another function. It may be necessary to hold the Function key (Usually marked as Fn) as Print Screen is pressed





Wired keyboard

Laptop keyboard

2a. If taking a shot of a specific window, holding the Alt key and pressing Print Screen (Alt+Fn+Print Screen on a laptop) will only capture the contents of the currently selected window





Wired keyboard

Laptop keyboard

- 3. Open MS Paint
 - For Windows XP and Windows 7 Paint is located in the Accessories folder of the Start menu, follow the above steps for locating Snipping Tool
 - For Windows 8 Follow the steps for the Snipping Tool above to go to the Search box on the Start screen. Search for Paint

4. With Paint open, press either Ctrl+V on the keyboard to paste the screenshot, click the Paste button in the upper left-hand corner of the screen (Windows 7), or select Paste from the Edit menu at the top of the screen (Windows XP). The screenshot will appear in the drawing area.

5. Save the screenshot to Desktop or another folder where it can be easily located. Attach it to the eService case as needed.

| Campaign code | Screencap, screen cap, screen shot |
|------------------------------------|---|
| Solution visibility | Dealer distribution |
| Function(s)/compone | nt(s) affected |
| Function affected | MID 140 - IC04 / IC05, Diagnostic tool, Impact |
| Function Group | |
| Function Group | 0 General, 1 standard parts, service and maintenance material, 2 engine with mounting and equipment, 3 electric power supply; lighting; instruments; software; warning and information system |
| Customer effect | |
| Main customer effect | calibration/programming/pairing/missing operation , diagnostics/methodology , fault code/display , visual appearance |
| Conditions | |
| Vehicle operating mode | on start-up, when driving, when stationary |
| Frequency of occurrence of problem | random |
| Administration | |
| Author | RU4469V |
| Dealer ID | RU4469V |
| | |

| Last modified by | A241298 |
|-------------------------|------------------|
| Creation date | 28-12-2017 19:12 |
| Date of last update | 13-05-2019 15:05 |
| Status | Published |

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| | LA JAMES JOHNSON | | 2549-08-03-03 NOX Conversion | Simulation | Information >> Conditions >> Execution | Purpose | Check the SCR system's efficiency in reducing the amount of nitrogen oxides (NOx) in the exhaust gas | Components to be tested are: | Aftertreatment selective catalytic reduction (SCR) system performance NOx sensor | Description | The test can be used when: | Fault tracing - Confirmation of active DTCs Fault tracing - Complement to dosing test and DEF quality check Verification - To compare system behaviour before and after repair | Note: Operation may take approximately 20 - 30 minute(s) to complete | ▼ Information | Continue > Cancel | Continue > Offline | ▲ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● |
|-----------|------------------|-----------------|------------------------------|------------|--|---------|--|------------------------------|---|-------------|----------------------------|--|--|---------------|-------------------|-----------------------|--|
| | | Program | | | | | | | | | | | | | | | eg) |
| | | Calibrate | | | | | | | | | | | | | | | œ: |
| | | Test | | | | | | | | | | | | | | | Ø |
| | | Diagnose | | | | | | | | | | | | | | | |
| | Links Help | Product History | | | | | | | | | | | | | | 90687 Work Order: 000 | |
| Tech Tool | Tech Tool | Product | | | | | | | | | | | | | | Chassis ID: N 80 | Y A |

| X | LA JAMES JOHNSON | | | | | E JAMES JOHNSON | | | | | | | | |
|-----------|------------------|--|------------------------------|------------|-----------|-----------------|--|------------------------------|------------|--|---|---|-----------|--|
| | | | 2549-08-03-03 NOX Conversion | Simulation | | | | 2549-08-03-03 NOX Conversion | Simulation | Information >> Conditions >> Execution | Manual conditions 1 Parking brake applied 2 Accelerator pedal (AP) released | 3 Engine running 4 Vehicle outdoors in a suitable area | Confirmed | |
| | Help | duct History Diagnose Test Calibrate Program | | | | Help | duct History Diagnose Test Calibrate Program | | | | a Released | 3 Seoorpin | Lida | |
| Tech Tool | Tech Tool Links | Product Pro | | | Tech Tool | Tech Tool Links | Product Pro |) € 7 | | | | | | |

| | E- JAMES JOHNSON | | 2549-08-03-03 NOx Conversion | Simulation | | E JAMES JOHNSON | | 2549-08-03-03 NOX Conversion | Information >> Conditions >> Execution | Information | 12 Action | 10 ↓ In order for the test to make a proper evaluation, the engine must shut down once the test is completed. If the engine does not shut down, the test did not complete correctly. | 7 : 1 Start the test 2 Wait until test has completed (Engine shut down) | Note: Some of the data in the graph does not change until the evaluation phase is near the end of the test (Conversion efficiency and DEF dosing amount) | Engine speed, NOX-in and NOX-out levels, Conversion efficiency and DEF dosing amount | ► Exhaust gas temperatures | ◆ Other sensors |
|-----|------------------|---|------------------------------|------------|-----|-----------------|---|------------------------------|---|--|-----------|--|--|--|--|---------------------------------------|---|
| ool | fool Links Help | uct Product History Diagnose Test Calibrate Program | | | bol | Tool Links Help | uct Product History Diagnose Test Calibrate Program | NOX Conversion Test | Enrino enood MOV in and MOV out founds. Connorcion officiance and NEE docing amount | בווקווה סףפכט, ועסא-וו מווע ועסא-טעו ופירכוס, כיטוויינין סוטו כווויכופוויל מווע טבר עסטוווע מווויטעווג | 2,750,100 | 2,250 80 - 20 - 2,000 - 70 | 1,750 60 | 1000 40 1000 30 | 500 - 20 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | [.s] Conversion Efficiency DEF Dosing |

| | I AMES JOHNSON | | 2549-08-03-03 NOx Conversion | Simulation | | I AMES JOHNSON | | | | | | • | | | | | | | | | | | | | | | |
|-----------|----------------|-----------------|------------------------------|------------|-----------|----------------|-----------------|------|---------------------------|------------------|---|------------------------|------------------------|-------------|------------|---------------------------|-----------------|---------------------------|---------------------|---------------------|----------------------|----------------------|--------------------|---------------------|---------------------|---------------------|---------------------|
| | | Program | | | | | Program | | | | | | | | | | | | | | | | | | eration | | |
| | | Calibrate | | | | | Calibrate | | | | | | | | | | | | | | thecks | | | stics | Service Regen | Logged Data | |
| | | Test | | | | | Test | | | | | | int | | | | | | st Drive | ve | Systems, C | ion | - | ent Diagno: | ent System. | ent System | |
| | | Diagnose | | | | | Diagnose | | Ľ | | | | and equipme | | | tystem | | tterm | Pressure, Te. | onse, Test Dri | and Exhaust | e Brake Funct | Hold Function | st Aftertreatm | st Aftertreatm. | st Aftertreatm. | onversion |
| | Links Help | Product History | | | | Links Help | Product History | | 1 operation and click Sta | Sort by function | | ervice and maintenance | ngine, Engine mounting | 0 - General | 1 - Engine | 2 - Lubrication and Oil S | 3 - Fuel system | 5 - Inlet and exhaust sys | 2500-08-03-02 Boost | 2500-08-03-03 Respo | 2500-08-03-05 Intake | 2530-08-03-02 Engine | 2530-08-03-03 Warm | 2545-08-03-02 Exhau | 2589-08-03-02 Exhau | 2545-08-03-04 Exhau | 2549-08-03-03 NOX C |
| Tech Tool | Tech Tool | Product | | | Tech Tool | Tech Tool | Product | Test | Select an | (± | Q | + 1 - Se | = 2 - Er | ÷ 2(| ÷ 2. | + 2 | ± 2; | 12 | | | | | | | | | |

| | LA JAMES JOHNSON | | 2549-08-03-03 NOX Conversion | Simulation | Information >> Conditions >> Execution | Purpose | Check the SCR system's efficiency in reducing the amount of nitrogen oxides (NOx) in the exhaust gas | Components to be tested are: | Aftertreatment selective catalytic reduction (SCR) system performance NOx sensor | Description | The test can be used when: | Fault tracing - Confirmation of active DTCs Fault tracing - Complement to dosing test and DEF quality check Verification - To compare system behaviour before and after repair | Note: Operation may take approximately 20 - 30 minute(s) to complete | ▼ Information | Continue > Cancel | Continue > Offline | ▲ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● |
|-----------|------------------|-----------------|------------------------------|------------|--|---------|--|------------------------------|---|-------------|----------------------------|--|--|---------------|-------------------|-----------------------|--|
| | | Program | | | | | | | | | | | | | | | eg) |
| | | Calibrate | | | | | | | | | | | | | | | œ: |
| | | Test | | | | | | | | | | | | | | | Ø |
| | | Diagnose | | | | | | | | | | | | | | | |
| | Links Help | Product History | | | | | | | | | | | | | | 90687 Work Order: 000 | |
| Tech Tool | Tech Tool | Product | | | | | | | | | | | | | | Chassis ID: N 80 | Y A |

| E JAMES JOHNS | est Calibrate Program | 2549-08-03-03 NOX Conversion | Simulation | Lead James Joh | | Test Calibrate Program | 2589-08-03-18 Exhaust Aftertreatment System Analysis | Run the operation in simulation mode | * Purpose | nent System, Service Regeneration | nent System Logged Data Comprehensive check of Exhaust Aftertreatment System (EATS) | Note: This operation should only be used in the following circumstances | Reference from diagnostic/service information or Technical support | Citive catalytic reduction (SCR) system | Description | nent System Analysis | The ECM routine will perform a self-evaluating system test on the Exhaust Aftertreatment System (EATS) | All test can be performed in sequential order or specific sub-test that can be individually selected | Available sub-test that can be nefformed individually. | אמוומתוב אתרובאי חומי רמוי הבי הבויהוויובה ווומוארה אומי הביו הבי הבויהוויובה ווומואותהםוא. | 1 Aftertreatment hydrocarbon injection (AHI) system |
|---------------|----------------------------|------------------------------|------------|----------------|------------|--------------------------|--|---|-----------|-----------------------------------|--|---|--|---|-----------------------------|--------------------------------|--|--|--|---|---|
| | Calibrate Pro | | | | | Calibrate Pro | | | | Service Regeneration | ogged Data | | 5 | reduction (SCR) sys | | nalysis | | | | | |
| | est | | | | | Test | | | | ent System, | ent System L | Turke Frendik | d heating | ctive catalytic | | ent System / | | | | | |
| | - | | | | | | | | 1 | E | atm | - | rcec | elec | rain | atm | | | | | |
| | Diagnose | | | | | Diagnose | | t | | st Aftertreat | st Aftertrea | onversion | ie Georrie ystem, foi | atment s | ystem Di | st Aftertre | | | /stem | | ruments |
| Links Help | Product History Diagnose 1 | | | Links Help | Links Help | Product History Diagnose | | n operation and click Start Sort by function | | 2589-08-03-02 Exhaust Aftertreat | 2545-08-03-04 Exhaust Aftertrea | 2549-08-03-03 NOX Conversion | 253 1-08-03-02 Valiable Geoffie 2584-08-03-01 SCR System, for | 2589-08-03-05 Aftertreatment s | 2589-08-03-06 SCR System Di | 2589-08-03-18 Exhaust Aftertre | 6 - Cooling System | 7 - Engine controls | 8 - Ignition and control system | 9 - Miscellaneous | ectrical system and instruments |

| | LAND AND A LAND | | 2549-08-03-03 NOx Conversion | Simulation | | Lag JAMES JOHNSON | | EAL JOHNSON | | 2589-08-03-18 Exhaust Aftertreatment System Analysis | Simulation | Information >> Conditions >> Execution >> Result | Purpose | Comprehensive check of Exhaust Aftertreatment System (EATS) | Note: This operation should only be used in the following circumstances | Reference from diagnostic/service information or Technical support Relevant DTCs: P103C, P20EE, P225E, P225C, P229F, P2201, P0422 | Description | The ECM routine will perform a self-evaluating system test on the Exhaust Aftertreatment System (EATS) All test can be performed in sequential order or specific sub-test that can be individually selected | Available sub-test that can be performed individually. | 1 Attertreatment hydrocarbon injection (AHI) system |
|--------|---|--|------------------------------|------------|------|-------------------|------|-------------------|--|--|------------|--|---------|---|---|--|-------------|--|--|---|
| h Tool | n Tool Links Help | duct Product History Diagnose Test Calibrate Program | | | Tool | i Tool Links Help | Tool | 1 Tool Links Help | duct Product History Diagnose Test Calibrate Program | | | | | | | | | | | |

| X 0 - | La JAMES JOHNSON | | | | | E JAMES JOHNSON | | La JAMES JOHNSON | | ment System Analysis | | | | | D-tests at the same time in order to achieve an | nest can be selected individually based on mation or Technical Support. | |) system | | | _ |
|-----------|------------------|----------------|------------------------------|------------|-----------|-----------------|-----------|------------------|----------------|---------------------------------|------------|--|--|------------------|---|--|--|---|-------------|-------------------|----------------|
| | | | 2549-08-03-03 NOX Conversion | Simulation | | | | | | 2589-08-03-18 Exhaust Aftertrea | Simulation | Information >> Conditions >> Execution >> Result | Information | Action | this highly recommended to run all the s | opumal system evaluation. However, each s recommendation from diagnostic/service in | Note: All subtest are enabled by default | Deselect which subtest not to run Aftertreatment hydrocarbon injection (Al | VOX sensors | DEF dosing system | RCR afficiancy |
| | | rate Program | | | | | | | rate Program | | | | | | | | | | | | |
| | | st Calib | | | | | | | st Calib | | | | | | %0 | | | | | | |
| | | nose Te | | | | | | | nose Te | | | | atus: irt | | | | | | | | |
| | | ry Diagr | | | | | | | ry Diagr | | t | | ² dosing sta iting for sta | (%00 | | | | | | | |
| | inks Help | Product Histor | | | | inks Help | | inks Help | Product Histor | | Sta | | DEF | completed (0 - 1 | | ry Parameters | dary Parameters | | | | |
| Tech Tool | Tech Tool L | Product | | | Tech Tool | Tech Tool L | Tech Tool | Tech Tool L | Product | | | | | Percentage | | Primat | Secon | | | | |

| X 0 - | La JAMES JOHNSON | | | | | E JAMES JOHNSON | | La JAMES JOHNSON | | ment System Analysis | | | | | D-tests at the same time in order to achieve an | nest can be selected individually based on mation or Technical Support. | |) system | | | _ |
|-----------|------------------|----------------|------------------------------|------------|-----------|-----------------|-----------|------------------|----------------|---------------------------------|------------|--|--|------------------|---|--|--|---|-------------|-------------------|----------------|
| | | | 2549-08-03-03 NOX Conversion | Simulation | | | | | | 2589-08-03-18 Exhaust Aftertrea | Simulation | Information >> Conditions >> Execution >> Result | Information | Action | this highly recommended to run all the s | opumal system evaluation. However, each s recommendation from diagnostic/service in | Note: All subtest are enabled by default | Deselect which subtest not to run Aftertreatment hydrocarbon injection (Al | VOX sensors | DEF dosing system | RCR afficiancy |
| | | rate Program | | | | | | | rate Program | | | | | | | | | | | | |
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| | | nose Te | | | | | | | nose Te | | | | atus: irt | | | | | | | | |
| | | ry Diagr | | | | | | | ry Diagr | | t | | ² dosing sta iting for sta | (%00 | | | | | | | |
| | inks Help | Product Histor | | | | inks Help | | inks Help | Product Histor | | Sta | | DEF | completed (0 - 1 | | ry Parameters | dary Parameters | | | | |
| Tech Tool | Tech Tool L | Product | | | Tech Tool | Tech Tool L | Tech Tool | Tech Tool L | Product | | | | | Percentage | | Primat | Secon | | | | |

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|---------------|---|--|--|--|--|---|---|---|--|---|--|--|--|--|---|---|---|---|--|
| JAMES. | | | | 0 | JAMES | | JAMES | | | | | | | | | | | | |
| | | 549-08-03-03 NOx Conversion | Simulation | | Ξ | | | | 589-08-03-18 Exhaust Aftertreatment System Analysis | Simulation | formation >> Conditions >> Execution >> Result | Result | Recommended actions | AHI Response | Not tested | NOX inlet response | Restart the test | NOX outlet response | Replace the NOx outlet sensor (post-SCR) |
| | | 2 | - | | | I | | | 3 | | = | Ľ | | | | | | | |
| s Help | oduct History Diagnose Test Calibrate Program | | | | s Help | | s Help | oduct History Diagnose Test Calibrate Program | t | Atl Response | | NOx inlet response | | NOx outlet response | | DEF dosing system | | SCR efficiency | |
| Tech Tool Lin | Product P | | | Tech Tool | Tech Tool Lin | Tech Tool | Tech Tool Lin | Product P | Test resu | | | | | | | | | | |
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