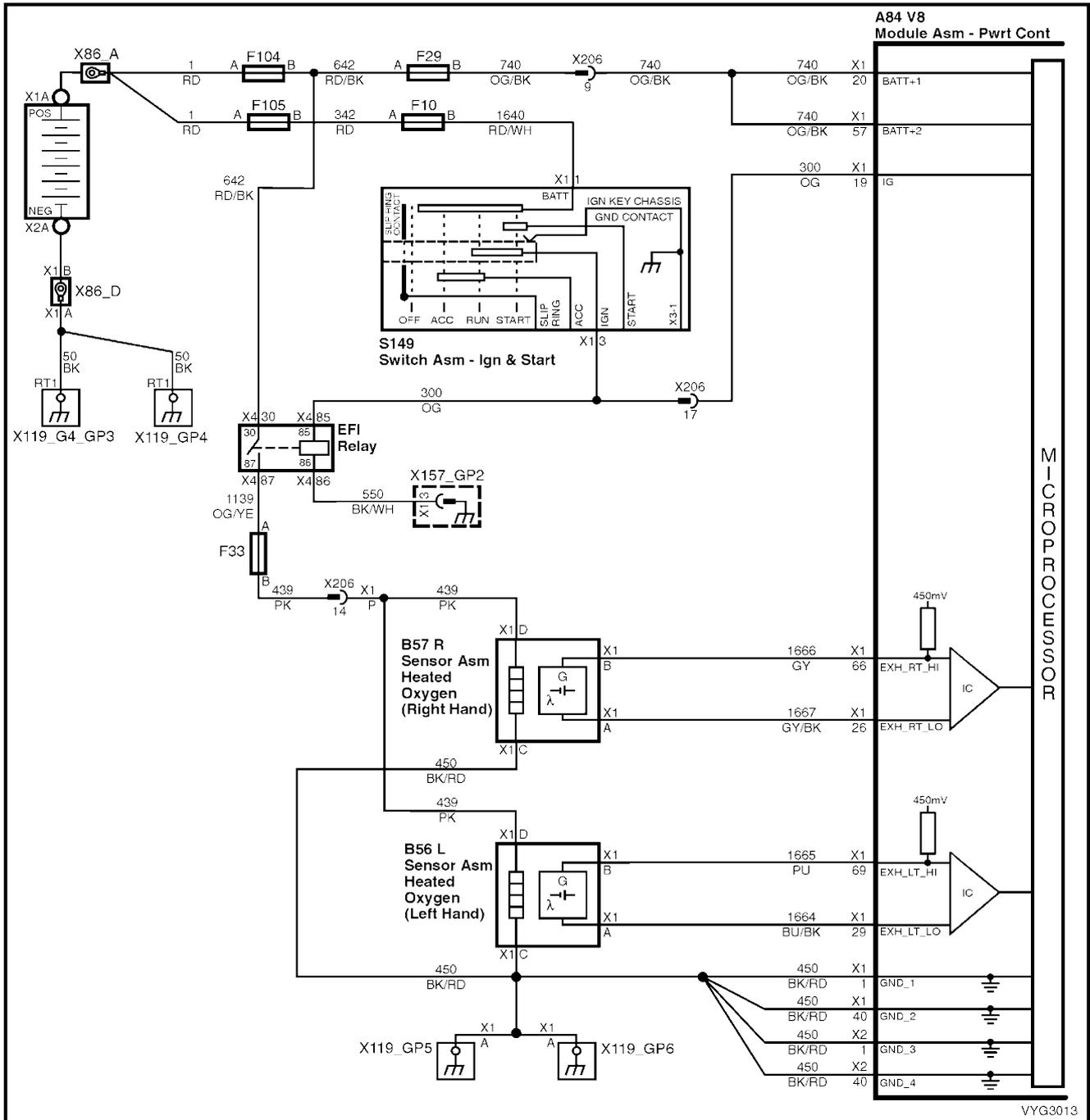


# GEN III V8 PCM – DTC P0131 HEATED OXYGEN SENSOR (HO2S) CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1



**Figure 6C3-2A-58 – Oxygen Sensor Circuits**

## CIRCUIT DESCRIPTION

The PCM supplies a voltage of about 450 mV between the HO2S high and low signal circuits. The oxygen sensor varies the voltage over a range from about 1000 mV when the exhaust is rich, down through about 10 mV when the exhaust is lean.

The PCM monitors and stores the Heated Oxygen Sensor (HO2S) voltage information. The PCM evaluates the HO2S voltage samples in order to determine the amount of time the HO2S voltage was out of range. The PCM compares the stored HO2S voltage samples, taken within each sample period, and determines if majority of the samples are out of the operating range.

The PCM monitors the HO2S voltage for being fixed below a predetermined voltage. If the PCM detects the voltage is below a predetermined voltage, a DTC will set.

## CONDITIONS FOR RUNNING THE DTC

### Criteria 1

- DTCs P0101, P0102, P0103, P0112, P0113, P0117, P0118, P0121, P0122, P0123, P0335, P0336, P0351-P0358, P1258 are not set.
- The engine coolant temperature is greater than 48° C.
- The ignition voltage is greater than 9.0 volts.
- The fuel system is operating in Closed Loop.
- The fuel trim learn is enabled.
- The air/fuel ratio is between 14.5:1 and 14.7:1.
- The TP angle is between 0% and 70%.

### Criteria 2

- DTCs P0101, P0102, P0103, P0112, P0113, P0117, P0118, P0121, P0122, P0123, P0335, P0336, P0351-P0358, P1258 are not set.
- The ignition voltage is greater than 9.0 volts.
- The Power Enrichment mode is enabled for at least 0.5 seconds.

## CONDITIONS FOR SETTING THE DTC

### Criteria 1

- The HO2S signal voltage remains below 200 mV.
- The Criteria 1 conditions are present for at least 33 seconds.

### Criteria 2

- The HO2S signal voltage remains below 360 mV.
- The Criteria 2 conditions are present for at least five seconds.

## ACTION TAKEN WHEN THE DTC SETS

- The PCM activates the Check Powertrain MIL when the diagnostic runs and fails.
- The PCM records the operating conditions at the time the diagnostic fails. The PCM stores this information in the Freeze Frame/Failure Records.
- Open Loop Fuelling.

## CONDITIONS FOR CLEARING THE MIL/DTC

- The PCM deactivates the Check Powertrain MIL after one ignition cycle that the diagnostic runs and does not fail.
- A last test failed (current DTC) clears when the diagnostic runs and does not fail.
- Use Tech 2 to clear the MIL/DTC.

## DIAGNOSTIC AIDS

- The PCM sets this DTC when the vehicle runs out of fuel.
- Heated Oxygen Sensor (HO2S) wire: Sensor pigtail may be in contact with the exhaust manifold or the exhaust system.
- An oxygen supply inside the HO2S is necessary for proper operation. The HO2S wires provide the supply of oxygen. Inspect the HO2S wires and connections for breaks or contamination.

**IMPORTANT:** Under no circumstances are the wiring harness connectors associated with the heated oxygen sensor circuits to be sealed in any way, by using grease or other substances. To do so, would result in an inadequate supply of reference air to be able to reach the atmospheric reference cavity of each sensor, resulting in a DTC to be set. If a flexible sealant is used (i.e. grease), then this would be drawn into the sensor cavity, poisoning the sensor, resulting in a premature failure. Also, should connector damage be evident, then the sensor and lead must be replaced, as soldering of the wiring would also negate the 'breathing' capability of the sensor wiring.

- Check for intermittent ground in signal wire between connector and sensor.
- Lean injector(s): Perform the Injector Balance Test.
- Fuel contamination: Water near the in-tank fuel pump inlet can be delivered to the injectors. The water causes a lean exhaust and can set a DTC.
- Fuel pressure: System will be lean if fuel pressure is low. Refer to [Fuel System Diagnosis Table](#) in this Section.
- Exhaust leaks: An exhaust leak near the HO2S can cause a lean condition.
- Vacuum or crankcase leaks can cause a lean condition.
- If the above are OK, the HO2S may be at fault.
- For an intermittent condition, refer to [Section 6C3-2B SYMPTOMS](#) in this Section.

**TEST DESCRIPTION**

**NOTE:** The number(s) below refer to the step number(s) on the diagnostic table.

2. If the HO2S voltage is fixed well below 200 mV this indicates a short to ground. If the voltage is fixed near or above 200 mV, this indicates a short to a PCM ground. When the HO2S voltage is fixed near 200 mV, indicates the DTC set when the fuel system was in a Power Enrichment mode of operation. This DTC sets if the HO2S voltage is less than 360 mV during a Power Enrichment mode of operation.
3. Using the Freeze Frame/Failure Records data may aid in locating an intermittent condition. If you cannot duplicate the DTC, the information included in the Freeze Frame/Failure Records data can help determine the distance travelled since the DTC set. The Fail Counter and Pass Counter can also help determine how many ignition cycles the diagnostic reported a pass and/or fail. Operate the vehicle within the same freeze frame condition (RPM, load, vehicle speed, temperature etc.) that you observed. This will isolate when the DTC failed.
4. Disconnecting the HO2S should cause the HO2S voltage to display the bias voltage. A voltage staying near 0.0 volts indicates the high circuit is grounded.
5. Disconnecting the PCM allows using a DMM to check continuity of the circuits. This aids in locating an open or shorted circuit.

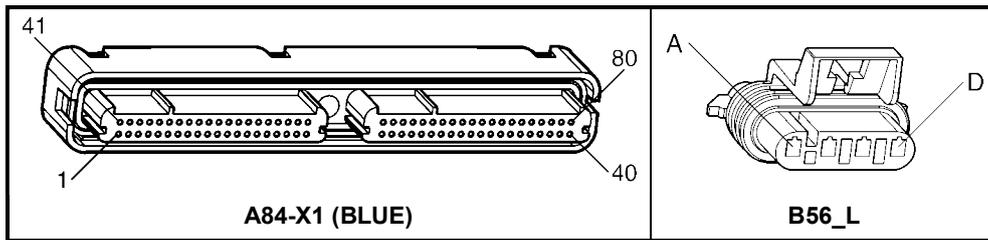


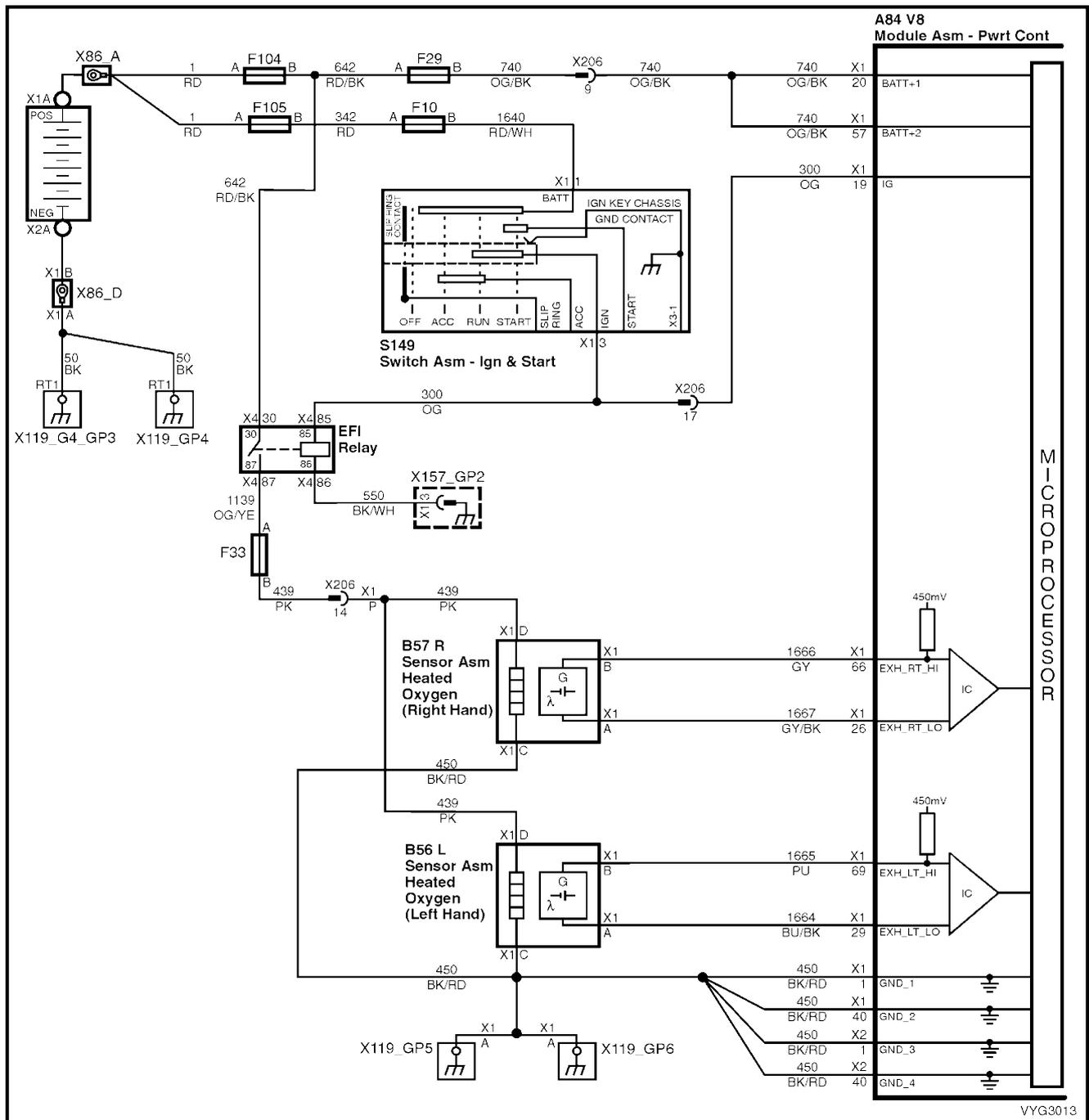
Figure 6C3-2A-59

**GEN III V8 PCM –  
DTC P0131 HEATED OXYGEN SENSOR (HO2S) CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1**

STEP	ACTION	VALUE	YES	NO
1.	Was the "On-Board Diagnostic" (OBD) System Check performed?		Go to Step 2	Go to <a href="#">OBD System Check</a> in this Section.
2.	<b>IMPORTANT:</b> Check the HO2S for being secure before proceeding with this DTC. A sensor that is loose could cause this DTC to set. 1. Install Tech 2. 2. Idle the engine at the normal operating temperature. 3. Operate the vehicle within parameters specified under Conditions for Running the DTC in the supporting text. 4. Monitor the HO2S voltage display on the Engine Data List using Tech 2. Is the HO2S voltage less than the specified value?	200 mV	Go to Step 4	Go to Step 3
3.	1. Ignition ON, engine OFF. 2. Review the Freeze Frame/Failure Records data for this DTC and observe the parameters. 3. Turn OFF the ignition for 15 seconds. 4. Idle the engine. 5. Operate the vehicle, within the conditions required for this diagnostic to run, and as close to the conditions recorded in the Freeze Frame/Failure Records as possible. Special operating conditions that you need to meet before the PCM will run this diagnostic, where applicable, are listed in Conditions for Running the DTC. 6. Select the Diagnostic Trouble Code (DTC), the DTC Information option and the Failed This Ignition option using Tech 2. Does Tech 2 indicate that this diagnostic failed this ignition?		Go to Step 4	Go to Diagnostic Aids
4.	1. Disconnect the HO2S, harness connector B56_L. Is the HO2S voltage within the specified range?	350-550 mV	Go to Step 7	Go to Step 5

STEP	ACTION	VALUE	YES	NO
5.	<ol style="list-style-type: none"> <li>Ignition OFF.</li> <li>Disconnect the PCM BLUE connector A84-X1.</li> <li>Check the HO2S signal circuit 1665 for a short to ground or a short to the sensor ground circuit 1664.</li> </ol> Is the HO2S signal circuit shorted?		Go to Step 6	Go to Step 8
6.	<ol style="list-style-type: none"> <li>Repair the HO2S signal circuit.</li> </ol> Is the action complete?		Go to Step 9	–
7.	<ol style="list-style-type: none"> <li>Replace Oxygen Sensor. Refer to 2.8 Heated Oxygen Sensor, in 6C3-3 SERVICE OPERATIONS.</li> </ol> Is action complete?		Go to Step 9	
8.	<ol style="list-style-type: none"> <li>Replace PCM. Refer to PCM Programming and PCM/PIM/BCM Security Link Procedure, in 6C3-3 SERVICE OPERATIONS.</li> </ol> Is action complete?		Go to Step 9	–
9.	<ol style="list-style-type: none"> <li>Select the Diagnostic Trouble Code (DTC) option and the Clear DTC Information option using Tech 2.</li> <li>Idle the engine at the normal operating temperature.</li> <li>Select the Diagnostic Trouble Code (DTC) option, the DTC Information option and the Failed This Ignition option using Tech 2.</li> <li>Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text, if applicable.</li> </ol> Does Tech 2 indicate that this DTC reset?		Go to Step 2	Go to Step 10
10.	<ol style="list-style-type: none"> <li>Using Tech 2, check for any other DTCs.</li> </ol> Does Tech 2 display any DTCs that you have not diagnosed?		Go to the applicable DTC table	System OK

## GEN III V8 PCM – DTC P0132 HEATED OXYGEN SENSOR (HO2S) CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1



**Figure 6C3-2A-60 – Oxygen Sensor Circuits**

### CIRCUIT DESCRIPTION

The PCM supplies a voltage of about 450 mV between the HO2S high and low signal circuits. The oxygen sensor varies the voltage over a range from about 1000 mV when the exhaust is rich, down through about 10 mV when the exhaust is lean.

The PCM monitors and stores the Heated Oxygen Sensor (HO2S) voltage information. The PCM evaluates the HO2S voltage samples in order to determine the amount of time the HO2S voltage was out of range. The PCM compares the stored HO2S voltage samples, taken within each sample period, and determines if majority of the samples are out of the operating range.

The PCM monitors the HO2S voltage for being fixed above a predetermined voltage. If the PCM detects the voltage is above the predetermined voltage, a DTC will set.

## CONDITIONS FOR RUNNING THE DTC

### Criteria 1

- DTCs P0101, P0102, P0103, P0112, P0113, P0117, P0118, P0121, P0122, P0123, P0335, P0336, P0351-P0358, P1258 are not set.
- The ignition voltage is greater than 9.0 volts.
- The fuel system is operating in Closed Loop.
- The fuel trim learn is enabled.
- The air/fuel ratio is between 14.5:1 and 14.7:1.

### Criteria 2

- DTCs P0101, P0102, P0103, P0112, P0113, P0117, P0118, P0121, P0122, P0123, P0335, P0336, P0351-P0358, P1258 are not set.
- The ignition voltage is greater than 9.0 volts.
- Deceleration Fuel Cut-Off mode is enabled for greater than one second.

## CONDITIONS FOR SETTING THE DTC

### Criteria 1

- The HO2S signal voltage remains above 775 mV.
- The Criteria 1 conditions are present for at least 33 seconds.

### Criteria 2

- The HO2S signal voltage remains above 540 mV.
- The Criteria 2 conditions are present for at least five seconds.

## ACTION TAKEN WHEN THE DTC SETS

- The PCM activates the Check Powertrain MIL when the diagnostic runs and fails.
- The PCM records the operating conditions at the time the diagnostic fails. The PCM stores this information in the Freeze Frame/Failure Records.
- Open Loop Fuelling.

## CONDITIONS FOR CLEARING THE MIL/DTC

- The PCM deactivates the Check Powertrain MIL after one ignition cycle that the diagnostic runs and does not fail.
- A last test failed (current DTC) clears when the diagnostic runs and does not fail.
- Use Tech 2 to clear the MIL/DTC.

## DIAGNOSTIC AIDS

- Check the HO2S electrical connections for evidence of water intrusion. Water present in the connector will cause the B+ supply to the heater to bleed over to the signal circuit.
- Fuel pressure: The system goes rich if the pressure is too high. The PCM compensates for some increase. However, if the fuel pressure is too high, a DTC may set. Refer to [Fuel System Diagnosis Table](#) in this Section.
- Rich injector(s): Perform the Injector Balance Test.
- Leaking injector: Refer to the [Fuel System Diagnosis Table](#) in this Section.
- Evaporative emissions (EVAP) canister purge. Check for fuel saturation. If full of fuel, check the canister control and hoses. Refer to [Section 6C3-1, EVAP Control System](#) description in this Section.
- MAF sensor: Disconnect the MAF sensor and see if the rich condition is corrected. If so, check for proper installation. If installation is OK, replace the MAF sensor. If the MAF sensor is installed backwards, the system goes rich. The plastic portion of the sensor has arrows cast into it indicating proper air flow direction. The arrows must point towards the engine.
- An oxygen supply inside the HO2S is necessary for proper operation. The HO2S wires provides the supply of oxygen. Inspect the HO2S wires and connections for breaks or contamination.  
**IMPORTANT:** Under no circumstances are the wiring harness connectors associated with the heated oxygen sensor circuits to be sealed in any way, by using grease or other substances. To do so, would result in an inadequate supply of reference air to be able to reach the atmospheric reference cavity of each sensor, resulting in a DTC to be set. If a flexible sealant is used (i.e. grease), then this would be drawn into the sensor cavity, poisoning the sensor, resulting in a premature failure. Also, should connector damage be evident, then the sensor and lead must be replaced, as soldering of the wiring would also negate the 'breathing' capability of the sensor wiring.
- TP sensor: An intermittent TP sensor output causes the system to go rich, due to a false indication of the engine accelerating. For an intermittent condition, refer to [Section 6C3-2B SYMPTOMS](#) in this Section.

**TEST DESCRIPTION**

**NOTE:** The number(s) below refer to the step number(s) on the diagnostic table.

2. This DTC also sets during a deceleration fuel cut-off. Inspect items which could cause a rich exhaust during a deceleration (leaking injectors, stuck injectors, etc.). Refer to Conditions for Setting the DTC. The engine must be at the normal operating temperature before performing this test. For any test that requires probing the PCM or a component harness connector, use the Connector Test Adaptor Kit J 35616-A. Using this kit prevents damage to the harness connector terminals.
3. Using the Freeze Frame/Failure Records data may aid in locating an intermittent condition. If you can not duplicate the DTC, the information included in the Freeze Frame/Failure Records data can help determine the distance travelled since the DTC set. The Fail Counter and Pass Counter can also aid in determining how many ignition cycles the diagnostic reported a pass and/or a fail. Operate the vehicle within the same freeze frame conditions (RPM, load, vehicle speed, temperature etc.) that the PCM recorded. This will isolate when the DTC failed. Refer to [Section 6C3-2B SYMPTOMS](#).
5. Disconnecting the HO2S should cause the HO2S voltage to display a bias voltage.
9. Review the system mechanisation. Check for a short between the HO2S signal circuit and any other wires powered by this fuse that run together inside the same harness.

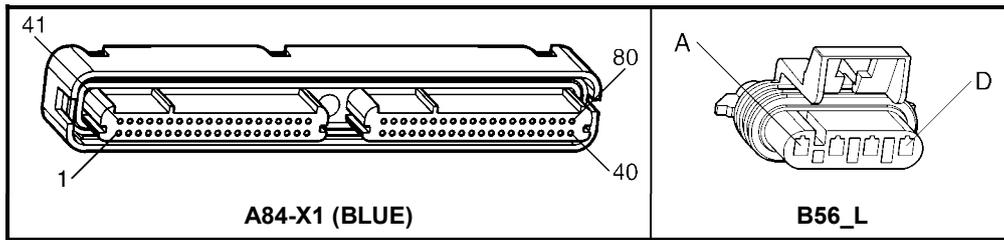


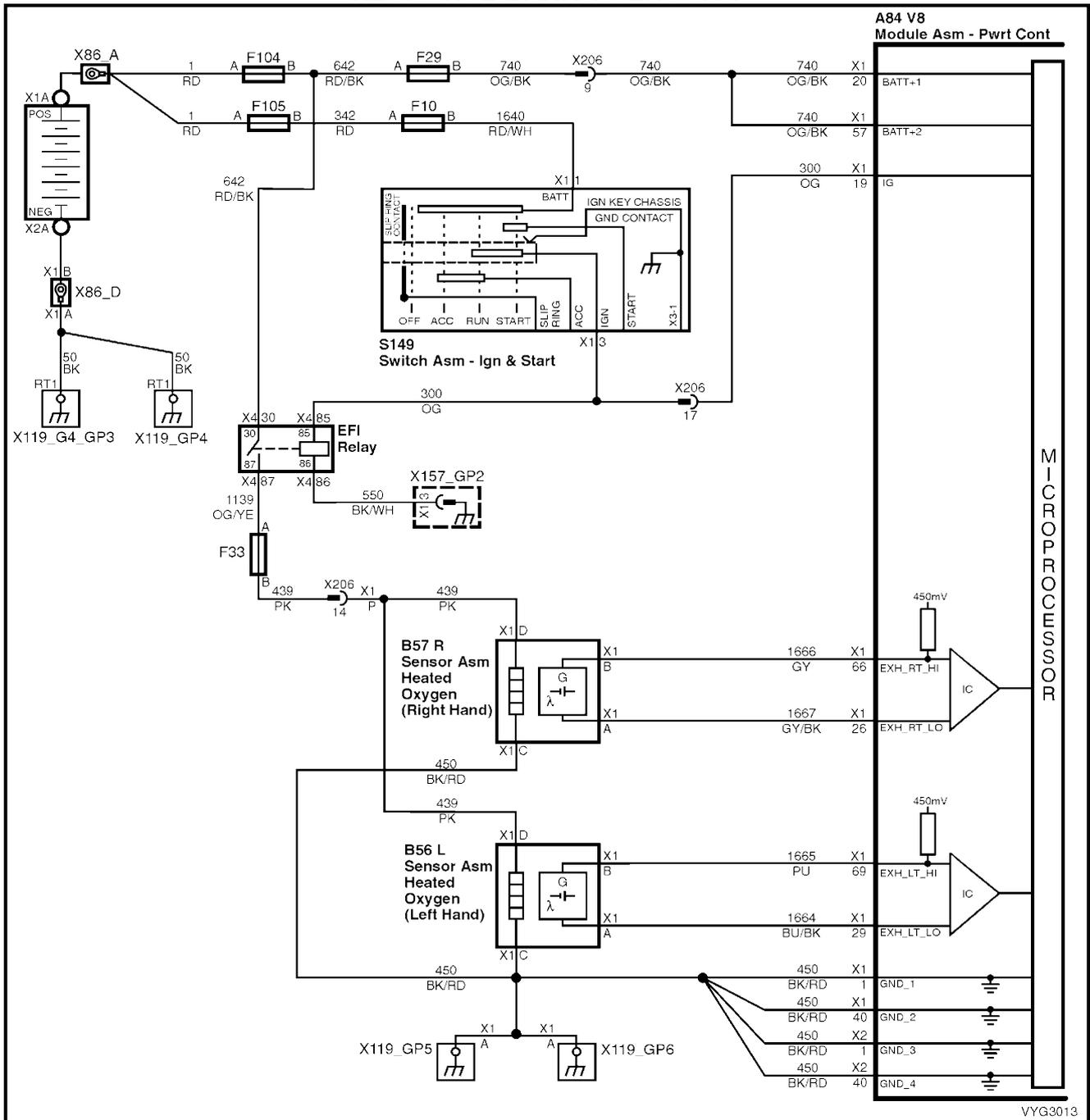
Figure 6C3-2A-61

**GEN III V8 PCM –  
DTC P0132 HEATED OXYGEN SENSOR (HO2S) CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1**

STEP	ACTION	VALUE	YES	NO
1.	Was the "On-Board Diagnostic" (OBD) System Check performed?		Go to Step 2	Go to <a href="#">OBD System Check</a> in this Section.
2.	<ol style="list-style-type: none"> <li>1. Install Tech 2.</li> <li>2. Idle the engine at the normal operating temperature.</li> <li>3. Operate the vehicle within parameters specified under Conditions for Running the DTC in the supporting text.</li> <li>4. Monitor the HO2S voltage display on the Engine Data List using Tech 2.</li> </ol> Is the HO2S voltage greater than the specified value?	775 mV	Go to Step 4	Go to Step 3
3.	<ol style="list-style-type: none"> <li>1. Ignition ON, engine OFF.</li> <li>2. Review the Freeze Frame/Failure Records data for this DTC and observe the parameters.</li> <li>3. Turn OFF the ignition for 15 seconds.</li> <li>4. Idle the engine.</li> <li>5. Operate the vehicle, within the conditions required for this diagnostic to run, and as close to the conditions recorded in the Freeze Frame/Failure Records as possible. Special operating conditions that you need to meet before the PCM will run this diagnostic, where applicable, are listed in Conditions for Running the DTC.</li> <li>6. Select the Diagnostic Trouble Code (DTC), the DTC Information option and the Failed This Ignition option using Tech 2.</li> </ol> Does Tech 2 indicate that this DTC failed this ignition?		Go to Step 4	Go to Diagnostic Aids
4.	<ol style="list-style-type: none"> <li>1. Ignition ON, engine OFF.</li> <li>2. Remove the HO2S heater fuse while monitoring the HO2S voltage using Tech 2.</li> </ol> Does the voltage drop to within the specified range when the power to the heater is disconnected?	350-550 mV	Go to Step 5	Go to Step 7

STEP	ACTION	VALUE	YES	NO
5.	<ol style="list-style-type: none"> <li>1. Reinstall the fuse.</li> <li>2. Disconnect the HO2S, harness connector B56_L.</li> </ol> Does Tech 2 indicate the HO2S voltage within the specified value?	350-550 mV	Go to Step 10	Go to Step 6
6.	<ol style="list-style-type: none"> <li>1. Ignition ON, engine OFF.</li> <li>2. Remove the HO2S heater fuse while monitoring the HO2S voltage using Tech 2.</li> </ol> Does the voltage drop to within the specified range when the power to the heater is disconnected?	350-550 mV	Go to Step 9	Go to Step 8
7.	<ol style="list-style-type: none"> <li>1. Ignition OFF.</li> <li>2. Disconnect the PCM BLUE connector A84-X1.</li> <li>3. Disconnect the HO2S, harness connector B56_L.</li> <li>4. Ignition ON.</li> <li>5. Check for voltage on the HO2S sensor signal circuit 1665 at the PCM harness connector using a DMM.</li> </ol> Is a voltage present?		Go to Step 8	Go to Step 11
8.	<ol style="list-style-type: none"> <li>1. Repair the short to voltage in the HO2S signal circuit 1665.</li> </ol> Is the action complete?		Go to Step 12	–
9.	<ol style="list-style-type: none"> <li>1. Repair the short between the HO2S signal circuit 1665 and the HO2S heater B+ circuit 439.</li> </ol> Is the action complete?		Go to Step 12	–
10.	<ol style="list-style-type: none"> <li>1. Replace the HO2S.</li> </ol> Is the action complete?		Go to Step 12	–
11.	<ol style="list-style-type: none"> <li>1. Replace PCM. Refer to PCM Programming and PCMP/PIM/BCM Security Link Procedure in 6C3-3 SERVICE OPERATIONS.</li> </ol> Is action complete?		Go to Step 12	–
12.	<ol style="list-style-type: none"> <li>1. Select the Diagnostic Trouble Code (DTC) option and the Clear DTC Information option using Tech 2.</li> <li>2. Idle the engine at the normal operating temperature.</li> <li>3. Select the Diagnostic Trouble Code (DTC) option, the DTC Information option and the Failed This Ignition option using the Tech 2.</li> <li>4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text, if applicable.</li> </ol> Does the Tech 2 indicate that this DTC reset?		Go to Step 2	Go to Step 13
13.	<ol style="list-style-type: none"> <li>1. Using Tech 2, check for any other DTCs.</li> </ol> Does Tech 2 display any DTCs that you have not diagnosed?		Go to the applicable DTC table	System OK

# GEN III V8 PCM –DTC P0133 HEATED OXYGEN SENSOR (HO2S) SLOW RESPONSE BANK 1 SENSOR 1



**Figure 6C3-2A-62 – Oxygen Sensor Circuits**

## CIRCUIT DESCRIPTION

The PCM continuously monitors the Heated Oxygen Sensor (HO2S) activity for 100 seconds. During the monitor period the PCM counts the number of times that the HO2S responds from rich to lean and from lean to rich and adds the amount of time it took to complete all transitions. With this information, the PCM can determine the average time for all transitions. If the average response time is too slow, the DTC will set.

The PCM determines the lean to rich transition when the HO2S voltage changes from less than 300 mV to greater than 600 mV. The PCM determines the rich to lean transition when the HO2S voltage changes from more than 600 mV to less than 300 mV. An HO2S that responds too slowly is more likely defective. Replace the HO2S.

### CONDITIONS FOR RUNNING THE DTC

- DTCs P0101, P0102, P0103, P0112, P0113, P0117, P0118, P0121, P0122, P0123, P0335, P0336, P0351-P0358, P1258 are not set.
- The engine coolant temperature is greater than 65° C.
- The ignition voltage is greater than 9.0 volts.
- The fuel system is operating in Closed Loop.
- The engine speed is between 1000 RPM and 2300 RPM.
- The engine air flow is between 20 g/s and 50 g/s.
- The EVAP canister purge duty cycle is greater than 0%.
- The engine run time is greater than 120 seconds.

### CONDITIONS FOR SETTING THE DTC

- The Lean to Rich response (below 300 mV to above 600 mV) average time is greater than 100 milliseconds.
- The Rich to Lean response (above 600 mV to below 300 mV) average time is greater than 100 milliseconds.

### ACTION TAKEN WHEN THE DTC SETS

- The PCM activates the Check Powertrain MIL when the diagnostic runs and fails.
- The PCM records the operating conditions at the time the diagnostic fails. The PCM stores this information in the Freeze Frame/Failure Records.
- Open Loop Fuelling.

### CONDITIONS FOR CLEARING THE MIL/DTC

- The PCM deactivates the Check Powertrain MIL after one ignition cycle that the diagnostic runs and does not fail.
- A last test failed (current DTC) clears when the diagnostic runs and does not fail.
- Use Tech 2 to clear the MIL/DTC.

### DIAGNOSTIC AIDS

- This diagnostic only runs once per ignition cycle.
- A malfunction in the HO2S heater circuits cause a DTC to set. Check HO2S heater circuit for intermittent opens/connections.
- An oxygen supply inside the HO2S is necessary for proper operation. The HO2S wires provide the supply of oxygen. Inspect the HO2S wires and connections for breaks or contamination. Refer to [Section 12P, Electrical Diagnosis Repair Procedures](#).

**IMPORTANT:** Under no circumstances are the wiring harness connectors associated with the heated oxygen sensor circuits to be sealed in any way by using grease or other substances. To do so, would result in an inadequate supply of reference air to be able to reach the atmospheric reference cavity of each sensor, resulting in a DTC to be set. If a flexible sealant is used (i.e. grease), then this would be drawn into the sensor cavity, poisoning the sensor, resulting in a premature failure. Also, should connector damage be evident, then the sensor and lead must be replaced, as soldering of the wiring would also negate the 'breathing' capability of the sensor wiring.

- Using the Freeze Frame/Failure Records data may aid in locating an intermittent condition. If you cannot duplicate the DTC, the information included in the Freeze Frame/Failure Records data can help determine the distance travelled since the DTC set. The Fail Counter and Pass Counter can also help determine how many ignition cycles the diagnostic reported a pass and/or fail. Operate the vehicle within the same freeze frame conditions (RPM, load, vehicle speed, temperature etc.) that you observed. This will isolate when the DTC failed. For an intermittent condition, refer to [Section 6C3-2B SYMPTOMS](#) in this Section.

### TEST DESCRIPTION

**NOTE:** The number(s) below refer to the step number(s) on the diagnostic table.

2. This step determines if the fault is present. This test may take 5 minutes for the diagnostic to run. For any test that requires probing the PCM or a component harness connector, use the Connector Test Adaptor Kit J 35616-A. Using this kit prevents damage to the harness connector terminals.
3. When DTCs P0133 and P0153 are set at the same time, it is a good indication that a fuel contamination problem is present.
4. An exhaust leak 15 – 30 cm away from the HO2S can cause a DTC to set.
6. This step checks the integrity of the signal circuit to the PCM.
7. This step checks the integrity of the signal circuit to the PCM.
8. Certain RTV silicone gasket materials give off vapours that can contaminate the HO2S. There is also a possibility of silicone contamination caused by silicone in the fuel. If the sensors appear to be contaminated by silicone and all the silicone sealant is a non silicone base, advise the customer to try a different fuel company. A missing fuel filler restrictor indicates the customer may have used leaded fuel.

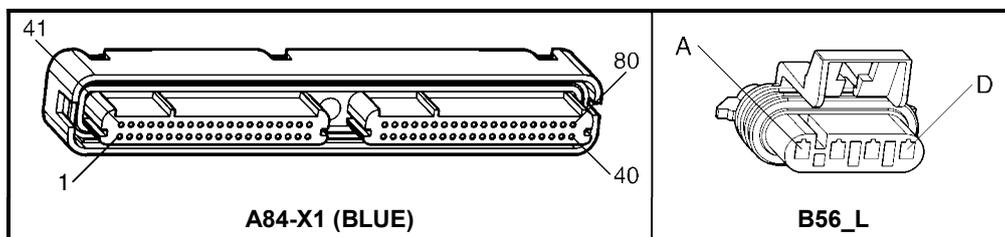


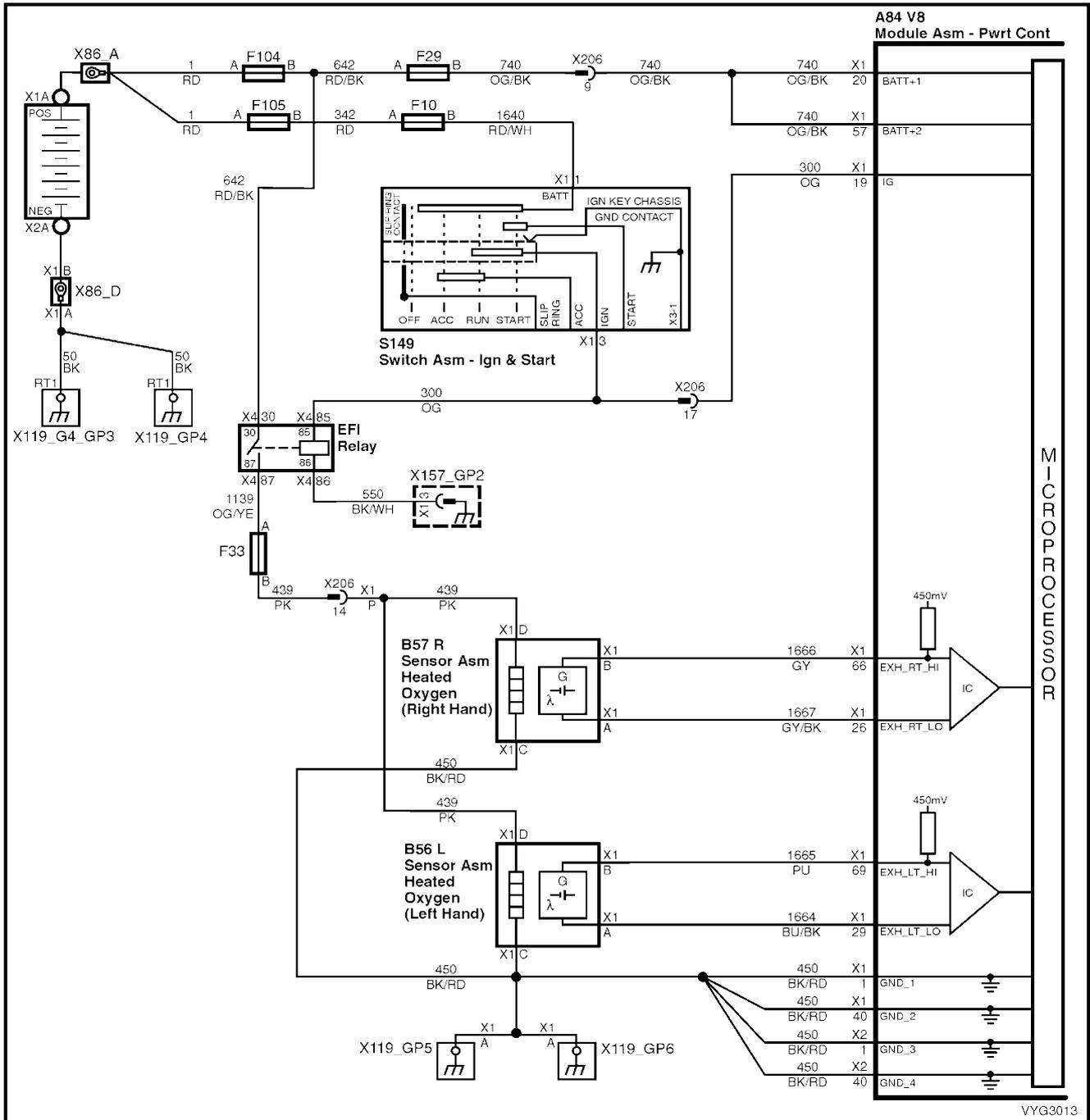
Figure 6C3-2A-63

**GEN III V8 PCM – DTC P0133 HEATED OXYGEN SENSOR (HO2S) SLOW RESPONSE BANK 1 SENSOR 1**

STEP	ACTION	VALUE	YES	NO
1.	Was the "On-Board Diagnostic" (OBD) System Check performed?		Go to Step 2	Go to <a href="#">OBD System Check</a> in this Section.
2.	<b>IMPORTANT:</b> If any DTCs are set (except P0153), refer to those DTCs before proceeding with this diagnostic table. 1. Install Tech 2. 2. Idle the engine at the normal operating temperature. 3. Operate the vehicle, within parameters specified under Conditions for Running the DTC as specified in the supporting text. 4. Monitor the Failed This Ignition option under the DTC Information option using Tech 2. Did DTC P0133 fail this ignition?		Go to Step 3	Go to Diagnostic Aids
3.	Did DTC P0153 also fail this ignition?		Go to Step 8	Go to Step 4
4.	1. Check for an exhaust system leak. After you inspect the exhaust system, return to this diagnostic. 2. If you find an exhaust leak, repair the exhaust leak as necessary. Did you isolate an exhaust leak?		Go to Step 2	Go to Step 5
5.	1. Inspect the following items: <ul style="list-style-type: none"> <li>• Ensure that the HO2S is securely installed.</li> <li>• Check for corrosion on the terminals.</li> <li>• Check the terminal tension at the HO2S harness connector B56_L and at the PCM, BLUE connector terminals X1-69 and X1-29.</li> <li>• Check for damaged wiring.</li> </ul> Did you find a problem in any of the above areas?		Go to Step 9	Go to Step 6
6.	1. Disconnect the Bank 1 HO2S. 2. Monitor the Bank 1 HO2S voltage on the Tech 2 'Engine Data List'. Does Tech 2 indicate a voltage within the specified range?	350-550 mV	Go to Step 7	Go to Step 10
7.	1. Jumper the Bank 1 HO2S high circuit 1665 and low (PCM side) circuit 1664. 2. Monitor the Bank 1 HO2S voltage using Tech 2. Does Tech 2 indicate a voltage below specified value?	200 mV	Go to Step 12	Go to Step 11
8.	<b>IMPORTANT:</b> Determine and correct the cause of the contamination before replacing a sensor. 1. Check for the following conditions: <ul style="list-style-type: none"> <li>• Fuel contamination</li> <li>• Use of improper RTV sealant</li> <li>• Engine oil/coolant consumption</li> </ul> 2. Replace the affected Heated Oxygen sensor(s). Is the action complete?		Go to Step 13	–
9.	1. Repair the conditions as necessary. Is the action complete?		Go to Step 13	–
10.	1. Repair the open Bank 1 HO2S low signal circuit or the grounded Bank 1 HO2S high signal circuit. Is the action complete?		Go to Step 13	–

STEP	ACTION	VALUE	YES	NO
11.	1. Repair the open Bank 1 HO2S high signal circuit 1665 or the faulty PCM connections. Is the action complete?		Go to Step 13	–
12.	1. Replace the Bank 1 HO2S. Is the action complete?		Go to Step 13	–
13.	1. Select the Diagnostic Trouble Code (DTC) option and the Clear DTC Information option using Tech 2. 2. Idle the engine at the normal operating temperature. 3. Select the Diagnostic Trouble Code (DTC) option, the DTC Information option and the Failed This Ignition option using Tech 2. 4. Operate the vehicle, within the Conditions for Running the DTC, as specified in the supporting text, if applicable. Does Tech 2 indicate that this DTC reset?		Go to Step 2	Go to Step 14
14.	1. Using Tech 2, check for any other DTCs. Does Tech 2 display any DTCs that you have not diagnosed?		Go to the applicable DTC table	System OK

# GEN III V8 PCM – DTC P0134 HEATED OXYGEN SENSOR (HO2S) INSUFFICIENT ACTIVITY BANK 1 SENSOR 1



**Figure 6C3-2A-64 – Oxygen Sensor Circuits**

## CIRCUIT DESCRIPTION

The PCM supplies a voltage of about 450 mV between the HO2S high and low signal circuits. The oxygen sensor varies the voltage over a range from about 1000 mV when the exhaust is rich, down through about 10 mV when the exhaust is lean.

The PCM monitors and stores the Heated Oxygen Sensor (HO2S) voltage information. The PCM evaluates the HO2S voltage samples in order to determine the amount of time the HO2S voltage was out of range. The PCM compares the stored HO2S voltage samples taken within each sample period and determines if majority of the samples are out of the operating range.

The PCM monitors the HO2S voltage and detects if the voltage goes out of the bias range. If the PCM does not detect the voltage went out of the bias range, the DTC will set.

### CONDITIONS FOR RUNNING THE DTC

- DTCs P0101, P0102, P0103, P0112, P0113, P0117, P0118, P0121, P0122, P0123, P0335, P0336, P0351-P0358, P1258 are not set.
- The ignition voltage is greater than 9.0 volts.
- The fuel system is operating in Closed Loop.
- The engine run time is greater than 70 seconds.
- The engine coolant temperature is greater than 48° C.

### CONDITIONS FOR SETTING THE DTC

- The HO2S signal voltage is steady between 350 mV and 550 mV.
- The conditions are present for at least 70 seconds.

### ACTION TAKEN WHEN THE DTC SETS

- The PCM activates the Check Powertrain MIL when the diagnostic runs and fails.
- The PCM records the operating conditions at the time the diagnostic fails. The PCM stores this information in the Freeze Frame/Failure Records.
- Open Loop Fuelling.

### CONDITIONS FOR CLEARING THE MIL/DTC

- The PCM deactivates the Check Powertrain MIL after one ignition cycle that the diagnostic runs and does not fail.
- A last test failed (current DTC) clears when the diagnostic runs and does not fail.
- Use Tech 2 to clear the MIL/DTC.

### DIAGNOSTIC AIDS

- An oxygen supply inside the HO2S is necessary for proper operation. The HO2S wires provides the supply of oxygen. Inspect the HO2S wires and connections for breaks or contamination. Refer to [Section 12P, Electrical Diagnosis/ Repair Procedures](#).

**IMPORTANT:** Under no circumstances are the wiring harness connectors associated with the heated oxygen sensor circuits to be sealed in any way, by using grease or other substances. To do so, would result in an inadequate supply of reference air to be able to reach the atmospheric reference cavity of each sensor, resulting in a DTC to be set. If a flexible sealant is used (i.e. grease), then this would be drawn into the sensor cavity, poisoning the sensor, resulting in a premature failure. Also, should connector damage be evident, then the sensor and lead must be replaced, as soldering of the wiring would also negate the 'breathing' capability of the sensor wiring.

- Using the Freeze Frame/Failure Records data may aid in locating an intermittent condition. If you cannot duplicate the DTC, the information included in the Freeze Frame/Failure Records data can help determine the distance travelled since the DTC set. The Fail Counter and Pass Counter can also help determine how many ignition cycles the diagnostic reported a pass and/or fail. Operate the vehicle within the same freeze frame conditions (RPM, load, vehicle speed, temperature etc.) that you observed. This will isolate when the DTC failed. For an intermittent condition, refer to [Section 6C3-2B SYMPTOMS](#), in this Section.

### TEST DESCRIPTION

**NOTE:** The number(s) below refer to the step number(s) on the diagnostic table.

2. The engine must be at normal operating temperature before performing this test. For any test that requires probing the PCM or a component harness connector, use the Connector Test Adaptor Kit J 35616-A. Using this kit prevents damage to the harness connector terminals.
3. Using the Freeze Frame/Failure Records data may aid in locating an intermittent condition. If you can not duplicate the DTC, the information included in the Freeze Frame/Failure Records data can help determine the distance travelled since the DTC set. The Fail Counter and Pass Counter can also aid in determining how many ignition cycles the diagnostic reported a pass and/or a fail. Operate the vehicle within the same freeze frame conditions (RPM, load, vehicle speed, temperature etc.) that the PCM recorded. This will isolate when the DTC failed. Refer to [Section 6C3-2B SYMPTOMS](#) in this Section.
4. If Tech 2 indicates the HO2S voltage goes below 200 mV, this indicates the HO2S circuits and PCM are OK.
5. This step checks whether the signal circuit from the PCM is OK.
6. Disconnecting the PCM allows the use of a DMM to check continuity of the circuits. This aids in locating an open or shorted circuit.
7. Disconnecting the PCM allows the use of a DMM to check continuity of the circuits. This aids in locating an open or shorted circuit.

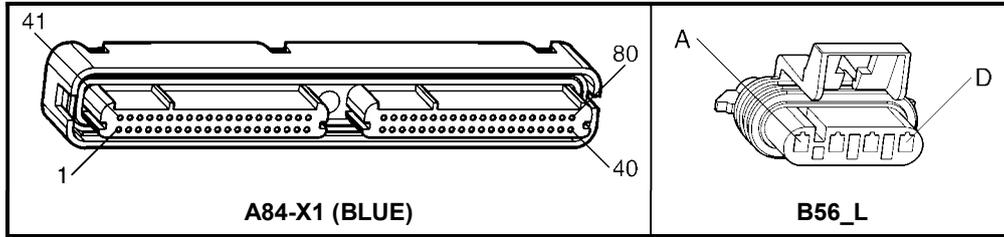


Figure 6C3-2A-65

**GEN III V8 PCM –  
DTC P0134 HEATED OXYGEN SENSOR (HO2S) INSUFFICIENT ACTIVITY BANK 1 SENSOR 1**

STEP	ACTION	VALUE	YES	NO
1.	Was the "On-Board Diagnostic" (OBD) System Check performed?		Go to Step 2	Go to <a href="#">OBD System Check</a> in this Section.
2.	<b>IMPORTANT:</b> Check the HO2S for being secure before proceeding with this DTC. A sensor that is loose could cause this DTC to set. 1. Install Tech 2. 2. Idle the engine at the normal operating temperature. 3. Operate the engine above 1200 RPM for two minutes. 4. Monitor the HO2S voltage display on the Tech 2 'Engine Data List'. Does Tech 2 indicate the Bank 1 HO2S voltage varying outside the specified value?	350-550 mV	Go to Step 3	Go to Step 4
3.	1. Ignition ON, engine OFF. 2. Review the Freeze Frame/Failure Records data for this DTC and observe the parameters. 3. Turn OFF the ignition for 15 seconds. 4. Idle the engine. 5. Operate the vehicle, within the conditions required for this diagnostic to run, and as close to the conditions recorded in Freeze Frame/Failure Records as possible. Special operating conditions that need to be met before the PCM will run this diagnostic where applicable, are listed in Conditions for Running the DTC. 6. Select the Diagnostic Trouble Code (DTC) option, the DTC Information option and the Failed This Ignition option using Tech 2. Does Tech 2 indicate that this DTC failed this ignition?		Go to Step 4	Go to Diagnostic Aids
4.	1. Ignition ON, engine OFF. 2. Disconnect the Bank 1 HO2S. 3. Jumper the HO2S high circuit 1665 and low (PCM side) circuit 1664. 4. Monitor the Bank 1 HO2S voltage using Tech 2. Is the Bank 1 HO2S voltage below the specified value?	200 mV	Go to Step 8	Go to Step 5
5.	1. Connect HO2S signal circuit 1665 to a known good ground, using a fused jumper wire. Does Tech 2 display Bank 1 HO2S voltage measure below the specified value?	200 mV	Go to Step 6	Go to Step 7
6.	1. Ignition OFF. 2. Disconnect the PCM BLUE connector A84-X1. 3. Check the continuity of the Bank 1 HO2S low circuit 1664. 4. Repair the open or the poor connection if the Bank 1 HO2S low circuit measures over the specified value. Did you find and correct the Bank 1 HO2S 1 low circuit condition?	2 Ω	Go to Step 13	Go to Step 9

STEP	ACTION	VALUE	YES	NO
7.	<ol style="list-style-type: none"> <li>Ignition OFF.</li> <li>Disconnect the PCM BLUE connector A84-X1.</li> <li>Check the continuity of the Bank 1 HO2S signal circuit 1665.</li> <li>Repair the open or the poor connection if the Bank 1 HO2S circuit 1665 measures over the specified value.</li> </ol> Did you find and correct the Bank 1 HO2S 1 signal circuit condition?	2 Ω	Go to Step 13	Go to Step 10
8.	<ol style="list-style-type: none"> <li>Check for a poor Bank 1 HO2S signal or low circuit terminal connection at the Bank 1 HO2S harness connector B56_L and replace the terminal(s) if necessary.</li> </ol> Did any terminals require replacement?		Go to Step 13	Go to Step 11
9.	<ol style="list-style-type: none"> <li>Check for a poor Bank 1 HO2S low circuit terminal connection at the PCM, and replace the terminal if necessary.</li> </ol> Did any terminals require replacement?		Go to Step 13	Go to Step 12
10.	<ol style="list-style-type: none"> <li>Check for a poor Bank 1 HO2S signal circuit terminal connection at the PCM, and replace the terminal if necessary.</li> </ol> Did any terminals require replacement?		Go to Step 13	Go to Step 12
11.	<ol style="list-style-type: none"> <li>Replace the Bank 1 HO2S.</li> </ol> Is the action complete?		Go to Step 13	–
12.	<ol style="list-style-type: none"> <li>Replace PCM. Refer to PCM Programming and PCM/PIM/BCM Security Link Procedure, in 6C3-3 SERVICE OPERATIONS, in this Section.</li> </ol> Is action complete?		Go to Step 13	–
13.	<ol style="list-style-type: none"> <li>Select the Diagnostic Trouble Code (DTC) option and the Clear DTC Information option using Tech 2.</li> <li>Idle the engine at the normal operating temperature.</li> <li>Select the Diagnostic Trouble Code (DTC) option, the DTC Information option and the Failed This Ignition option using Tech 2.</li> <li>Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text, if applicable.</li> </ol> Does Tech 2 indicate that this DTC reset?		Go to Step 2	Go to Step 14
14.	<ol style="list-style-type: none"> <li>Using Tech 2, check for any other DTCs.</li> </ol> Does Tech 2 display any DTCs that you have not diagnosed?		Go to the applicable DTC table	System OK