

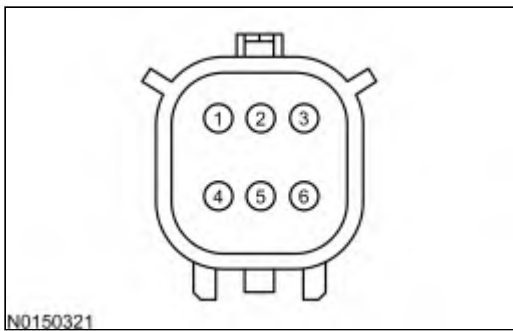
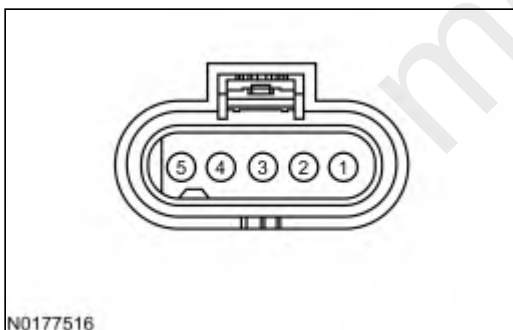
**DZ: Universal Heated Oxygen Sensor (HO2S)**

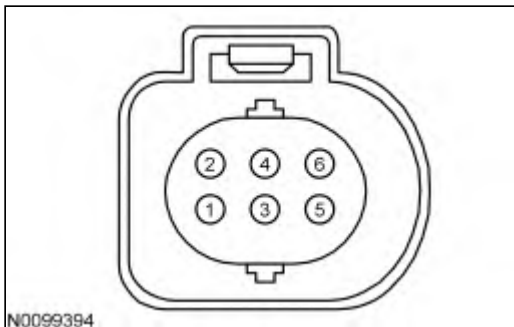
**⚠ WARNING:** While conducting tests on a hot engine take all safety precautions to prevent skin contact with hot engine components. Failure to follow these instructions may result in personal injury.

**Note:** Only diagnose the suspect universal HO2S indicated by the DTC.

This pinpoint test is intended to diagnose the following:

- universal HO2S (9Y460)
- harness circuits: UO2S, UO2SGREF, UO2SHTR, UO2SPC, UO2SPCT, and VPWR
- PCM (12A650)

**Universal HO2S Connector****A****B****C**



| Vehicle                                                                                                                                                                                                                                                                              | Connector | Pin                        | Circuit                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------|----------------------------------------------------------|
| Continental 3.7L,<br>E-Series,<br>F-650 / F-750,<br>Flex TiVCT 3.5L,<br>Mustang TiVCT 5.2L                                                                                                                                                                                           | A         | 6<br>1<br>5<br>4<br>2      | UO2SPC<br>VPWR<br>UO2SGREF<br>UO2S<br>UO2SHTR            |
| Corsair,<br>Edge 2.0L,<br>Escape/Kuga 2.0L,<br>Escape/Kuga 2.5L,<br>Explorer 2.3L,<br>F-150 3.3L,<br>F-150 5.0L,<br>Fusion 2.5L,<br>Mustang 5.0L,<br>Mustang 5.2L Supercharged,<br>Nautilus 2.0L,<br>Ranger,<br>Transit TiVCT 3.5L,<br>Transit Connect 2.0L,<br>Transit Connect 2.5L | B         | 3<br>4<br>1<br>2<br>5      | UO2SPC<br>VPWR<br>UO2SGREF<br>UO2S<br>UO2SHTR            |
| All other vehicles                                                                                                                                                                                                                                                                   | C         | 5<br>1<br>4<br>2<br>6<br>3 | UO2SPCT<br>UO2SPC<br>VPWR<br>UO2SGREF<br>UO2S<br>UO2SHTR |

### Powertrain Control Module (PCM) Connector

For PCM connector views or reference values, refer to Section 6, Reference Values.

| Vehicle | Connector | Pin | Circuit |
|---------|-----------|-----|---------|
|         |           |     |         |

| Vehicle                                                                                                                  | Connector | Pin                                                                | Circuit                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Continental 2.0L,<br>EcoSport 1.0L Automatic Transmission,<br>EcoSport 2.0L,<br>Fusion 1.5L,<br>Fusion 2.0L,<br>MKZ 2.0L | 198 PIN   | E64<br>E49<br>E14<br>E63<br>E48                                    | UO2S11<br>UO2SGREF11<br>UO2SHTR11<br>UO2SPC11<br>UO2SPCT11                                                               |
| Continental 2.7L,<br>Continental 3.0L,<br>Flex GTDI 3.5L,<br>Ford GT,<br>Fusion 2.7L,<br>MKZ 3.0L                        | 198 PIN   | E64<br>E62<br>E49<br>E47<br>E14<br>E15<br>E63<br>E61<br>E48<br>E46 | UO2S11<br>UO2S21<br>UO2SGREF11<br>UO2SGREF21<br>UO2SHTR11<br>UO2SHTR21<br>UO2SPC11<br>UO2SPC21<br>UO2SPCT11<br>UO2SPCT21 |
| Continental 3.7L,<br>E-Series,<br>F-650 / F-750,<br>Flex TiVCT 3.5L                                                      | 198 PIN   | E50<br>E51<br>E20<br>E21<br>E79<br>E84<br>E35<br>E36               | UO2S11<br>UO2S21<br>UO2SGREF11<br>UO2SGREF21<br>UO2SHTR11<br>UO2SHTR21<br>UO2SPC11<br>UO2SPC21                           |
| Corsair 2.0L,<br>Corsair 2.3L,<br>Edge 2.0L,<br>Escape/Kuga 2.0L,<br>Explorer 2.3L,<br>Ranger,<br>Transit Connect 2.0L   | 198 PIN   | E31<br>E32<br>E76<br>E33                                           | UO2S11<br>UO2SGREF11<br>UO2SHTR11<br>UO2SPC11                                                                            |
| Corsair 2.5L,<br>Escape/Kuga 2.5L,<br>Fusion 2.5L,<br>Transit Connect 2.5L                                               | 198 PIN   | E36<br>E21<br>E93<br>E6                                            | UO2S11<br>UO2SGREF11<br>UO2SHTR11<br>UO2SPC11                                                                            |
| EcoSport 1.0L Manual Transmission                                                                                        | 198 PIN   | E26<br>E25<br>E1<br>E39<br>E40                                     | UO2S11<br>UO2SGREF11<br>UO2SHTR11<br>UO2SPC11<br>UO2SPCT11                                                               |
| Escape/Kuga 1.5L,<br>Mustang 2.3L,<br>Nautilus 2.0L,<br>Transit Connect 1.0L                                             | 198 PIN   | E31<br>E32<br>E76<br>E33<br>E34                                    | UO2S11<br>UO2SGREF11<br>UO2SHTR11<br>UO2SPC11<br>UO2SPCT11                                                               |

| Vehicle                                                                                         | Connector | Pin                                                                | Circuit                                                                                                                  |
|-------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Expedition,<br>F-150 3.5L High Output,<br>Navigator                                             | 198 PIN   | E64<br>E66<br>E49<br>E51<br>E44<br>E11<br>E62<br>E63<br>E47<br>E48 | UO2S11<br>UO2S21<br>UO2SGREF11<br>UO2SGREF21<br>UO2SHTR11<br>UO2SHTR21<br>UO2SPC11<br>UO2SPC21<br>UO2SPCT11<br>UO2SPCT21 |
| F-150 3.3L,<br>F-150 5.0L,<br>Mustang 5.0L,<br>Mustang 5.2L Supercharged,<br>Transit TiVCT 3.5L | 306 PIN   | T59<br>T60<br>T44<br>T45<br>T76<br>T46<br>T29<br>T30               | UO2S11<br>UO2S21<br>UO2SGREF11<br>UO2SGREF21<br>UO2SHTR11<br>UO2SHTR21<br>UO2SPC11<br>UO2SPC21                           |
| Mustang TiVCT 5.2L                                                                              | 198 PIN   | E51<br>E50<br>E21<br>E20<br>E84<br>E79<br>E36<br>E35               | UO2S11<br>UO2S21<br>UO2SGREF11<br>UO2SGREF21<br>UO2SHTR11<br>UO2SHTR21<br>UO2SPC11<br>UO2SPC21                           |
| All other vehicles                                                                              | 306 PIN   | T59<br>T60<br>T44<br>T45<br>T76<br>T46<br>T29<br>T30<br>T14<br>T15 | UO2S11<br>UO2S21<br>UO2SGREF11<br>UO2SGREF21<br>UO2SHTR11<br>UO2SHTR21<br>UO2SPC11<br>UO2SPC21<br>UO2SPCT11<br>UO2SPCT21 |

**DZ1 CHECK FOR DTCS**

Are DTCS P0030, P0040, P0050, P0053, P0059, P0130, P0131, P0132, P0133, P0134, P0135, P0150, P0151, P0152, P0153, P0154, P0155, P064D, P064E, P1127, P1646, P1647, P164A, P164B, P2096, P2097, P2098, P2099, P2237, P2240, P2243, P2247, P2251, P2254, P2626, P2627, P2628, P2629, P2630, or P2631 present?

|            |                                                                                                                                                                                |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | For DTC P0040, GO to <a href="#">DZ2</a> .<br>For DTC P1127, GO to <a href="#">DZ17</a> .<br>For DTCS P0133, P0153, P2096, P2097, P2098 or P2099, GO to <a href="#">DZ17</a> . |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|           |                                                                                                                                                                                                         |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | For DTCs P2237, P2240, P2626 or P2629, GO to <a href="#">DZ22</a> .<br>For DTCs P164A, P164B, P2627, P2628, P2630 or P2631, GO to <a href="#">DZ23</a> .<br>For all others, GO to <a href="#">DZ3</a> . |
| <b>No</b> | For symptoms without DTCs, GO to <a href="#">DZ23</a> .<br>For all others, RETURN to Section 3, Symptom Charts for further direction.                                                                   |

**DZ2 CROSSED SENSOR WIRES**

- Ignition OFF.
- Check the vehicle repair history.
- Verify the connectors are connected to the correct engine bank.

**Is a concern present?**

|            |                                                                                                      |
|------------|------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | REPAIR as necessary.<br>Clear the PCM DTCs. REPEAT the self-test.                                    |
| <b>No</b>  | Unable to duplicate or identify the concern at this time.<br>GO to Pinpoint Test <a href="#">Z</a> . |

**DZ3 VISUALLY INSPECT THE UNIVERSAL HO2S HARNESS**

- Ignition OFF.
- Visually inspect for:
  - pinched, shorted, and corroded wiring and pins
  - oil or water contamination
  - crossed sensor wires
  - damaged universal HO2S

**Is a concern present?**

|            |                                                                                                                                                                                                        |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | REPAIR as necessary.<br>Clear the PCM DTCs. REPEAT the self-test.                                                                                                                                      |
| <b>No</b>  | For DTCs P0030, P0050, P064D, P064E, P1646 or P1647, GO to <a href="#">DZ4</a> .<br>For DTCs P0053, P0059, P0135 or P0155, GO to <a href="#">DZ7</a> .<br>For all others, GO to <a href="#">DZ12</a> . |

**DZ4 CHECK FOR MISFIRE CONCERNS AND AFTERMARKET EQUIPMENT**

- Ignition OFF.
- Check for the following:
  - misfire concern
  - non-factory or aftermarket equipment that may increase the exhaust temperature
- Universal HO2S connector disconnected.
- Check the universal HO2S connector for damage or corrosion.

**Is a concern present?**

|            |                                                                                                                    |
|------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | REPAIR as necessary.<br>Clear the PCM DTCs. REPEAT the self-test.                                                  |
| <b>No</b>  | For DTCs P064D, P064E, P1646 or P1647, GO to <a href="#">DZ27</a> .<br>For all others, GO to <a href="#">DZ5</a> . |

**DZ5 CHECK THE UO2SHTR CIRCUIT FOR A SHORT TO VOLTAGE**

- Ignition OFF.
- PCM connector disconnected.

- Ignition ON, engine OFF.
- Measure the voltage between:

| ( + ) Universal HO2S Connector, Harness Side | ( - )  |
|----------------------------------------------|--------|
| UO2SHTR                                      | Ground |

Is any voltage present?

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| <b>Yes</b> | REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test. |
| <b>No</b>  | GO to <a href="#">DZ6</a> .                                         |

#### DZ6 CHECK THE UO2S, UO2SGREF, UO2SHTR CIRCUITS FOR AN OPEN

- Ignition OFF.
- Measure the resistance between:

| ( + ) Universal HO2S Connector, Harness Side | ( - ) PCM Connector, Harness Side |
|----------------------------------------------|-----------------------------------|
| UO2S                                         | UO2S                              |
| UO2SGREF                                     | UO2SGREF                          |
| UO2SHTR                                      | UO2SHTR                           |

Are the resistances less than 5 ohms?

|            |                                                                    |
|------------|--------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DZ7</a> .                                        |
| <b>No</b>  | REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test. |

#### DZ7 CHECK FOR VPWR

- Ignition OFF.
- PCM connector connected.
- Universal HO2S connector disconnected.
- Ignition ON, engine OFF.
- Measure the voltage between:

| ( + ) Universal HO2S Connector, Harness Side | ( - )  |
|----------------------------------------------|--------|
| VPWR                                         | Ground |

Is the voltage greater than 10.5 V?

|            |                                                                                                     |
|------------|-----------------------------------------------------------------------------------------------------|
| <b>Yes</b> | For DTCs P0030 or P0050, GO to <a href="#">DZ9</a> .<br>For all others, GO to <a href="#">DZ8</a> . |
| <b>No</b>  | REPAIR the open circuit. CHECK the fuses.<br>Clear the PCM DTCs. REPEAT the self-test.              |

#### DZ8 CHECK THE UO2SHTR CIRCUIT FOR AN OPEN

- Ignition OFF.
- Universal HO2S connector disconnected.
- PCM connector disconnected.
- Measure the resistance between:

| ( + ) Universal HO2S Connector, Harness Side | ( - ) PCM Connector, Harness Side |
|----------------------------------------------|-----------------------------------|
| UO2SHTR                                      | UO2SHTR                           |

Is the resistance less than 5 ohms?

|            |                                                                    |
|------------|--------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DZ9</a> .                                        |
| <b>No</b>  | REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test. |

#### DZ9 CHECK THE UO2SHTR CIRCUIT FOR A SHORT

**Note:** This pinpoint test is designed to diagnose multiple circuits in the same test steps, only measure the circuits that apply to the vehicle being diagnosed.

- Ignition OFF.
- PCM connector disconnected.
- Measure the resistance between:

| ( + ) Universal HO2S Connector, Harness Side | ( - )  |
|----------------------------------------------|--------|
| UO2SHTR                                      | Ground |

- Measure the resistance between:

| ( + ) Universal HO2S Connector, Harness Side | ( - ) Universal HO2S Connector, Harness Side |
|----------------------------------------------|----------------------------------------------|
| UO2SHTR                                      | UO2S                                         |
| UO2SHTR                                      | UO2SGREF                                     |
| UO2SHTR                                      | UO2SPC                                       |
| UO2SHTR                                      | UO2SPCT                                      |
| UO2SHTR                                      | VPWR                                         |

Are the resistances greater than 10K ohms?

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DZ10</a> .                                        |
| <b>No</b>  | REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test. |

#### DZ10 CHECK THE INTERNAL RESISTANCE OF THE UNIVERSAL HO2S HEATER

- Measure the resistance between:

| ( + ) Universal HO2S Connector, Component Side | ( - ) Universal HO2S Connector, Component Side |
|------------------------------------------------|------------------------------------------------|
| VPWR                                           | UO2SHTR                                        |

Is the resistance between 1.8 - 6 ohms?

|            |                                                                                                                                                                                                                                                   |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DZ11</a> .                                                                                                                                                                                                                      |
| <b>No</b>  | INSTALL a new Universal HO2S. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls.<br>RESET the keep alive memory (KAM). REFER to Section 2, <a href="#">Resetting The Keep Alive Memory (KAM)</a> .<br>REPEAT the self-test. |

#### DZ11 CHECK THE UO2SHTR CIRCUIT FOR AN INTERNAL SHORT TO GROUND

- Measure the resistance between:

| ( + ) Universal HO2S Connector, Component Side | ( - )  |
|------------------------------------------------|--------|
| UO2SHTR                                        | Ground |

Is the resistance greater than 10K ohms?

|            |                                                                                                                                                                                                                                                   |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DZ27</a> .                                                                                                                                                                                                                      |
| <b>No</b>  | INSTALL a new Universal HO2S. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls.<br>RESET the keep alive memory (KAM). REFER to Section 2, <a href="#">Resetting The Keep Alive Memory (KAM)</a> .<br>REPEAT the self-test. |

#### DZ12 CHECK THE UO2S AND UO2SGREF CIRCUITS FOR AN OPEN

- Ignition OFF.
- Universal HO2S connector disconnected.
- PCM connector disconnected.
- Measure the resistance between:

| ( + ) Universal HO2S Connector, Harness Side | ( - ) PCM Connector, Harness Side |
|----------------------------------------------|-----------------------------------|
| UO2S                                         | UO2S                              |
| UO2SGREF                                     | UO2SGREF                          |

Are the resistances less than 5 ohms?

|            |                                                                    |
|------------|--------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DZ13</a> .                                       |
| <b>No</b>  | REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test. |

#### DZ13 CHECK THE UO2S, UO2SGREF, UO2SPC, AND UO2SPCT CIRCUITS FOR A SHORT TO GROUND

**Note:** This pinpoint test is designed to diagnose multiple circuits in the same test steps, only measure the circuits that apply to the vehicle being diagnosed.

- Measure the resistance between:

| ( + ) Universal HO2S Connector, Harness Side | ( - )  |
|----------------------------------------------|--------|
| UO2S                                         | Ground |
| UO2SGREF                                     | Ground |
| UO2SPC                                       | Ground |
| UO2SPCT                                      | Ground |

Are the resistances greater than 10K ohms?

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DZ14</a> .                                        |
| <b>No</b>  | REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test. |

#### DZ14 CHECK THE UO2S, UO2SGREF, UO2SPC, AND UO2SPCT CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition ON, engine OFF.
- Measure the voltage between:

| ( + ) Universal HO2S Connector, Harness Side | ( - )  |
|----------------------------------------------|--------|
| UO2S                                         | Ground |
| UO2SGREF                                     | Ground |
| UO2SPC                                       | Ground |
| UO2SPCT                                      | Ground |

Is any voltage present?

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| <b>Yes</b> | REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test. |
| <b>No</b>  | GO to <a href="#">DZ15</a> .                                        |

#### DZ15 CHECK THE UO2SGREF CIRCUIT FOR VOLTAGE

- Ignition OFF.
- PCM connector connected.
- Ignition ON, engine OFF.
- Measure the voltage between:

| ( + ) Universal HO2S Connector, Harness Side | ( - )  |
|----------------------------------------------|--------|
| UO2SGREF                                     | Ground |

#### Universal HO2S UO2SGREF Circuit Voltage

| Vehicle                                                                                                                                                                                   | Voltage   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Aviator, Corsair, Edge, Escape/Kuga, Explorer, F-150, F-Series Super Duty, Motorhome / Stripped Chassis / Step Van, Mustang 5.0L, Mustang 5.2L, Nautilus, Ranger 2.3L, Transit 3.5L TiVCT | 7.5 - 7.8 |
| E-Series                                                                                                                                                                                  | 2 - 2.4   |

| Vehicle                                                                                                                                                                                                 | Voltage     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Continental 2.0L, Continental 2.7L, Continental 3.0L, EcoSport 2.0L, Flex 3.5L GTDI, Ford GT, Fusion 1.5L, Fusion 2.0L, Fusion 2.7L, MKZ, Transit 3.5L GTDI, Transit Connect 1.0L, Transit Connect 2.0L | 2.4 - 2.6   |
| Continental 3.7L, F-650 / F-750, Fusion 2.5L, Transit Connect 2.5L                                                                                                                                      | 0.55 - 0.75 |
| All others                                                                                                                                                                                              | 3.5 - 3.7   |

#### Is the voltage within specification?

|            |                                                                                                                                                                                                                                                   |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | INSTALL a new Universal HO2S. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls.<br>RESET the keep alive memory (KAM). REFER to Section 2, <a href="#">Resetting The Keep Alive Memory (KAM)</a> .<br>REPEAT the self-test. |
| <b>No</b>  | GO to <a href="#">DZ27</a> .                                                                                                                                                                                                                      |

#### DZ16 EXHAUST TEMPERATURE OUT OF RANGE

**Note:** Diagnose all other powertrain related DTCs first.

- Ignition ON, engine running.
- Engine at normal operating temperature.
- Access the PCM and monitor the HTR11 (MODE) and HTR21 (MODE) PIDs.

#### Are the PID states ON?

|            |                                                                             |
|------------|-----------------------------------------------------------------------------|
| <b>Yes</b> | CARRY OUT the KOER self-test.                                               |
| <b>No</b>  | RUN the engine until the PID indicates ON.<br>CARRY OUT the KOER self-test. |

#### DZ17 CARRY OUT THE KOER SELF-TEST

- Engine at normal operating temperature.
- Carry out the PCM KOER self-test.

#### Are any DTCs present other than P0133, P0153, P2096, P2097, P2098, or P2099?

|            |                                                                                                                                                                                   |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | DISREGARD the current diagnostic trouble code (DTC) at this time. DIAGNOSE the next DTC. GO to Section 4, <a href="#">Diagnostic Trouble Code (DTC) Charts and Descriptions</a> . |
| <b>No</b>  | For DTCs P0133 or P0153, GO to <a href="#">DZ20</a> .<br>For all others, GO to <a href="#">DZ18</a> .                                                                             |

#### DZ18 VISUALLY INSPECT THE UPSTREAM AND DOWNSTREAM HO2S CONNECTORS

- Ignition OFF.
- Universal HO2S connector disconnected.
- HO2S12 connector disconnected.
- HO2S22 connector disconnected.
- Check for a loose connection and damaged or corroded pins.

#### Is a concern present?

|            |                      |
|------------|----------------------|
| <b>Yes</b> | REPAIR as necessary. |
|------------|----------------------|

|           |                                                                                                                                         |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------|
|           | RESET the keep alive memory (KAM). REFER to Section 2, <a href="#">Resetting The Keep Alive Memory (KAM)</a> .<br>REPEAT the self-test. |
| <b>No</b> | GO to <a href="#">DZ19</a> .                                                                                                            |

**DZ19 CHECK FOR LEAKS IN THE EXHAUST SYSTEM**

- Visually inspect the exhaust system for the following:
  - exhaust leaks at flanges and gaskets
  - HO2S not tightened to specification
  - physical exhaust system concerns
  - aftermarket exhaust
  - punctures or cracks in the catalytic converter

**Is a concern present?**

|            |                                                                                                                                                                 |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | REPAIR as necessary.<br>RESET the keep alive memory (KAM). REFER to Section 2, <a href="#">Resetting The Keep Alive Memory (KAM)</a> .<br>REPEAT the self-test. |
| <b>No</b>  | GO to <a href="#">DZ20</a> .                                                                                                                                    |

**DZ20 CHECK FOR POTENTIAL SENSOR CONTAMINATION CONCERNS**

- Investigate the following items as potential sources of universal HO2S contamination:
  - use of unapproved silicon sealers
  - fuel contaminated by silicon additives
  - excessive oil consumption
  - glycol leaking internally in the engine
  - lead-contaminated fuel
  - short drive cycles in cold weather
  - use of unapproved cleaning agents

**Is a concern present?**

|            |                                                                                                                                                                                                                                                                                                                                       |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | REPAIR the source of the contamination.<br>INSTALL a new Universal HO2S. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls.<br>CHANGE the engine oil and oil filter.<br>RESET the keep alive memory (KAM). REFER to Section 2, <a href="#">Resetting The Keep Alive Memory (KAM)</a> .<br>REPEAT the self-test. |
| <b>No</b>  | For DTCs P0133 or P0153, GO to <a href="#">DZ21</a> .<br>For all others, INSTALL a new Universal HO2S. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls.<br>RESET the keep alive memory (KAM). REFER to Section 2, <a href="#">Resetting The Keep Alive Memory (KAM)</a> .<br>REPEAT the self-test.            |

**DZ21 CHECK THE UNIVERSAL HO2S RESPONSE TEST RESULTS**

- Ignition ON, engine OFF.
- Access the diagnostic monitoring test results for the HO2S11 and HO2S21. Refer to Section 2, [Diagnostic Monitoring Test Results Mode 6](#).

**Is the indicated value between the minimum threshold and the maximum threshold?**

|            |                                                                                                        |
|------------|--------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | Unable to duplicate or identify the concern at this time.<br>Clear the PCM DTCs. REPEAT the self-test. |
| <b>No</b>  | INSTALL a new Universal HO2S. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. |

|                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------|
| RESET the keep alive memory (KAM). REFER to Section 2, <a href="#">Resetting The Keep Alive Memory (KAM)</a> .<br>REPEAT the self-test. |
|-----------------------------------------------------------------------------------------------------------------------------------------|

**DZ22 CHECK THE RESISTANCE OF THE CURRENT TRIM RESISTOR IN THE UNIVERSAL HO2S**

- Ignition OFF.
- Universal HO2S connector disconnected.
- Measure the resistance between:

| ( + ) Universal HO2S Connector, Component Side | ( - ) Universal HO2S Connector, Component Side |
|------------------------------------------------|------------------------------------------------|
| UO2SPCT                                        | UO2SPC                                         |

Is the resistance between 25 - 330 ohms?

|            |                                                                                                                                                                                                                                                   |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DZ23</a> .                                                                                                                                                                                                                      |
| <b>No</b>  | INSTALL a new Universal HO2S. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls.<br>RESET the keep alive memory (KAM), REFER to Section 2, <a href="#">Resetting The Keep Alive Memory (KAM)</a> .<br>REPEAT the self-test. |

**DZ23 CHECK THE UO2SPC AND THE UO2SPCT CIRCUITS FOR AN OPEN CIRCUIT**

- PCM connector disconnected.
- Measure the resistance between:

| ( + ) Universal HO2S Connector, Harness Side | ( - ) PCM Connector, Harness Side |
|----------------------------------------------|-----------------------------------|
| UO2SPC                                       | UO2SPC                            |
| UO2SPCT                                      | UO2SPCT                           |

Are the resistances less than 5 ohms?

|            |                                                                                                                                              |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | For DTCs P2237, P2240, P2626 or P2629 or symptoms without DTCs, GO to <a href="#">DZ27</a> .<br>For all others, GO to <a href="#">DZ24</a> . |
| <b>No</b>  | REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.                                                                           |

**DZ24 CHECK THE UO2SPCT CIRCUIT FOR A SHORT TO GROUND**

- Measure the resistance between:

| ( + ) PCM Connector, Harness Side | ( - )  |
|-----------------------------------|--------|
| UO2SPCT                           | Ground |

Is the resistance greater than 10K ohms?

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DZ25</a> .                                        |
| <b>No</b>  | REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test. |

**DZ25 CHECK THE UO2SPCT CIRCUIT FOR A SHORT TO VOLTAGE**

- Ignition ON, engine OFF.
- Measure the voltage between:

| ( + ) Universal HO2S Connector, Harness Side | ( - )  |
|----------------------------------------------|--------|
| UO2SPCT                                      | Ground |

Is any voltage present?

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| <b>Yes</b> | REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test. |
| <b>No</b>  | GO to <a href="#">DZ26</a> .                                        |

**DZ26 CHECK THE RESISTANCE OF THE LABEL RESISTOR IN THE UNIVERSAL HO2S**

- Measure the resistance between:

| ( + ) Universal HO2S Connector, Component Side | ( - ) Universal HO2S Connector, Component Side |
|------------------------------------------------|------------------------------------------------|
| UO2SPCT                                        | VPWR                                           |

Is the resistance between 3.5K - 999.9K ohms?

|            |                                                                                                                                                                                                                                                   |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | For DTCs P164A or P164B, unable to duplicate or identify the concern at this time.<br>GO to Pinpoint Test <a href="#">Z</a> .<br>For all others, GO to <a href="#">DZ27</a> .                                                                     |
| <b>No</b>  | INSTALL a new Universal HO2S. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls.<br>RESET the keep alive memory (KAM), REFER to Section 2, <a href="#">Resetting The Keep Alive Memory (KAM)</a> .<br>REPEAT the self-test. |

**DZ27 CHECK FOR CORRECT PCM OPERATION**

- Disconnect all the PCM connectors.
- Visually inspect for:
  - pushed out pins
  - corrosion
- Connect all the PCM connectors and make sure they seat correctly.
- Carry out the PCM self-test.
- Verify the concern is still present.

Is the concern still present?

|            |                                                                                                                                                                              |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | INSTALL a new PCM. REFER to Section 2, <a href="#">Flash Electrically Erasable Programmable Read Only Memory (EEPROM)</a> , Programming the VID Block for a Replacement PCM. |
| <b>No</b>  | The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.                                                           |

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